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PHARMACEUTICAL SOCIETY OF GHANA
P. O. BOX 2133
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THE GHANA PHARMACEUTICAL JOURNAL

Restricted

Incorporating the programme for the 33rd

GHANA PHARMACEUTICAL CONFERENCE AND EXHIBITION

August, 1975 at the STATE HOUSE, ACCRA.

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Volume 3 Nos. 2 & 3 August, 1975

The Ghana Pharmaceutical Journal

THE GHANA PHARMACEUTICAL JOURNAL

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PHARMACEUTICAL SOCIETY OF GHANA

33rd. Conference and Exhibition, 1975
August 28 - 30, 1975

Theme: **"PHARMACEUTICAL INDUSTRY AND THE NATIONAL ECONOMY"**

Venue: **CONFERENCE HALL, STATE HOUSE, ACCRA**

Guest speaker: **C. C. STEVENS Esq.,** OBE, LLB., FPS.
Immediate Past President, Pharmaceutical Society of Great Britain.

Under the Distinguished Chairmanship of
DR. K. SARPONG, B. Pharm., Ph. D., MPSG.
President, Pharmaceutical Society of Ghana.

D. ANIM-ADDO, Esq., B. Pharm., MPSG.
Hon. General Secretary.

THE PHARMACEUTICAL INDUSTRY

A Summary of the Address to be delivered by Mr C. C. Stevens, OBE, LLB, FPS, Immediate Past President of the Pharmaceutical Society of Great Britain and Guest Speaker to the 33rd Ghana Pharmaceutical Conference and Exhibition at the State House, Accra, on August 29, 1975.

1. Introduction; the need for and the value of a pharmaceutical industry to a state. The economic and political advantages.
2. Necessary assessments to be made before launching a pharmaceutical venture:-

   Data on the general economic and hygienic standards of the country, Demographic data, population structures and attitudes to medicines; Local patterns of medical treatment and cost; Existence and prevalance of diseases and common ailments; Size and nature of existing pharmaceutical market, traditional supply and distribution systems; Laws covering all aspects of pharmaceutical practice and also affecting the day to day running of a production unit; Local availability of trained manpower for industry; Availability locally of suitable packaging material; Present and projected demand for pharmaceuticals classified in therapeutic categories;

   Requirements of pharmaceuticals in the animal health sector; Attitudes towards foreign assistance and investments; Industrial feasibility of the manufacture of selected pharmaceuticals.
3. Economic aspects especially the pre-requisites for sound pharmaceutical production, which are:-

   Availability of specialists and facilities who can advise on therapeutic needs and progress. Existence of a number of hospitals and pharmacies, health centres, clinics and other facilities large enough to provide a permanent minimum level of consumption of pharmaceutical products and services produced by newly established industries. The local pharmaceutical market; population increase, urbanisation and health awareness. Export possibilities.

   Effects of a domestic industry. Saving in foreign currency, possibility of meeting special local demands currently not catered for.

   Consumption rate. This is of importance in developing countries where the rate of increase in consumption of pharmaceutical products continues to rise because of increasingly higher living and educational standards. The industry should therefore be planned for future developments.
4. Subjects dealt with under paragraphs 2 and 3 previously will in this section be related specifically to Ghana. Existing regulations and the state of the industry will be taken into consideration and some recommendations for the future respectfully made.
5. Mention made of the role of international agencies such as the United Nations Industrial Development Organisation and the World Health Organisation in the establishment of pharmaceutical industries in developing countries.

NOTICE

THE PHARMACEUTICAL SOCIETY OF GHANA

announces the removal of its Offices

and

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with effect from

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D. Anim-Addo
Hon. General Secretary.

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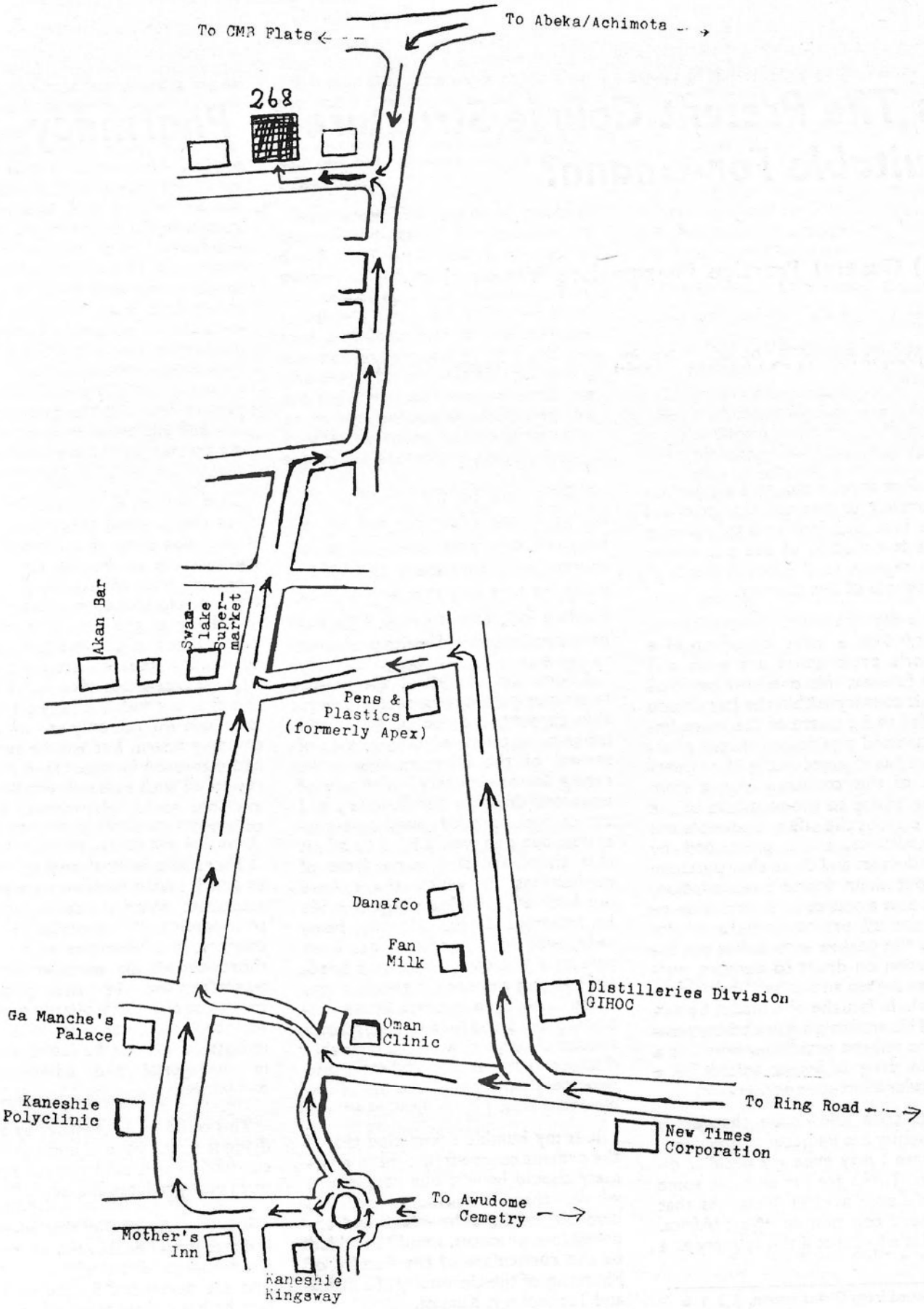

A SYMPOSIUM*

Is The Present Course Structure In Pharmacy Suitable For Ghana?

(iii) General Practice Pharmacist's View-point

By Joseph Pobee, B. Pharm., MPSG., Globe Pharmacy, Kumasi

Before anyone can give a meaningful answer to this question one will have first and foremost to examine what is expected of the pharmacist with regards to the health needs of the people of this country.

The days when the pharmacist was regarded as a mere dispenser of a doctor's prescription are gone and gone forever. No one who has lived in this country within the last decade can fail to be aware of the more important and significant role the pharmacist has assumed in the Health services of this country. Apart from giving advice to the members of the public about the safe and sensible use of medicines, those prescribed by their doctors and those they purchase without their doctor's prescription, he is also a source of information to the medical profession as a whole. He is the person who dishes out information on drugs to doctors, nurses, midwives and other health personnel. In fact the pharmacist by virtue of his profession is in a better position to tell the prescriber whether a certain drug is better suited for a particular ailment or not.

It is trite knowledge that every community has its peculiar problems, and here I may even say peculiar diseases. There are for example some ailments such as river blindness that are more common in West Africa. It is also a fact that if the country as a whole should be the proud beneficiaries of the education and knowledge of our pharmacists, then of course our pharmacists should be equipped in a way that will make it possible for them to deal with our peculiar ailments and health problems.

Before the advent of the white-man's medicine, our fore-fathers were able through the use of herbs and other concoctions to cure people of several of the ailments that were raging in this country. The use of imported drugs in our hospitals and clinics has achieved significant successes, but one would have to admit that there are still some areas of medications in which there have not been any significant impact made by imported drugs. Happily, however, traditional medicine has been able to make some significant headways in this respect. In recent times there have been reports in the national papers, and in medical circles of successful cures of hitherto incurable diseases like cancer, diabetes, and hypertension, through the use of traditional herbs.

It is my humble submission that if the present course-structure in pharmacy should benefit our people as a whole, then traditional medicine divorced of its unhygienic and superstitious practices, should be added to the curriculum of the Faculty of Pharmacy of the University of Science and Technology, Kumasi.

This action if implemented, allow the spirit of self-reliance wh is sweeping through all aspects of national life to be reflected in work of pharmacists in this co try. I would like to express my p found joy at the announcement cently that this University is activ conducting research into the phar ceutical properties of certain herb this country and it is hoped that lofty idea will not only remain on planning board, but will be serio and vigorously pursued, and that results of such research will be m available to all pharmacists in country.

There is one final and vital po to which I want to draw your gen attention. With the springing up pharmaceutical industries in country, it is necessary to inclu short course in management administration in the pharm course, so that those pharmacists will be called upon to man th industries will not be found want in managerial and administra capabilities.

This could be done either by em dying it in the general undergradu curriculum or it can be run as a sh term post-graduate course.

It is my strong belief that when is done, it will enable the pharma to discharge effectively, the du that are demanded by the new that he has rightly assumed now.

*Continued from Ghana Pharm. J. 3 1 6

(iv) An Industrial Pharmacist's Viewpoint

By Miss Jane Onny, B.Pharm., MPSG., Pharmaceutical Division, Ghana Industrial Holding Corporation, Accra.

During the past few years, a major change has been taking place in pharmacy education and this is likely to continue for several years. One reason for this change could be the search for an "acceptable role" for the Pharmacist and another reason could be the moulding of pharmacy education to suit that "acceptable role". Whatever the reason, many people will agree that education of the Pharmacist is now undergoing challenge and change in most countries and Ghana is no exception. Gone are the days when pharmacy only meant "the art of compounding and dispensing drugs", and equally gone are the days when the Pharmacist acted solely as "importer, wholesaler and retailer"!

Thus in this age of Clinical Pharmacy, the role of the Pharmacist as a member of the clinical pharmacology team and his potential position as an adviser in a large teaching hospital is well known. Likewise are the role of the Pharmacist in the chair of the Board of Directors in a Pharmaceutical Industrial concern; and that of the Pharmacist as the Managing Director of a multiple Pharmacy Business.

These developments need to be accompanied by the incorporation into the Pharmacy curriculum of formal instruction all the branches of the arts and sciences which are involved in these pharmaceutical fields. And this can only be achieved by giving a more elaborate training in Pharmacy Administration and Management, Industrial Pharmacy and Clinical Pharmacy; rather than the existing no-more-than-tentative inclusion of these studies in the syllabus. But this will only mean a rather expensive prolongation of the already lengthy course.

Therefore, in my opinion, the only approach to the problem will be one of re-orientation of the present course structure in such a way that the newly qualified Pharmacist will not only possess a lot of factual knowledge; but will also be able to apply these facts and principles. Thus this re-orientation will induce an earlier specialisation at University level.

Let not the Academics think that the specialisation acquired by the young graduate in the one-year national service, does, or even could bale out the University's responsibility.

We know that the new pharmaceutical industries, for instance, in developing countries have many problems; and one of these is the shortage of qualified personnel. This shortage is so acute because the practical problems met in the industry are not dealt with in the present pharmacy curriculum. Also there are very few, or in some cases, no pharmacy 'process workers', so the Pharmacist does all and closely supervises everything personally!

With our present form of pharmacy education, which gives plenty of factual knowledge; but instils rather very little confidence in application of principles, this is rather very difficult.

Thus I will like to suggest that the four-year course could still be retained but pursued in its present form only up to eight terms i.e. two years and two terms. During the 9th term i.e. the last term of the 3rd year, the under-graduate should be attached to one of the following pharmaceutical establishments:—

(1) a registered pharmacy

(2) a hospital pharmaceutical department or one in a similar institution

(3) a pharmaceutical industry

(4) a school of pharmacy or an analytical laboratory

and at all these establishments the students' employment should be directly related to the pharmaceutical subjects studied in the degree course.

In the 4th year, the student returns to 'campus' and takes the present section 'A' of the subjects:—

Pharmaceutics
Chemistry
Pharmacognosy
and Pharmacology.

But instead of choosing a principal or major subject from the above subjects; the student will rather choose a complete course in a special aspect of the practice of Pharmacy — and there starts specialisation.

i.e. The student may choose a course in:—

1. Clinical Pharmacy
2. Pharmacy Administration and Management or
3. Academic Pharmacy
4. Industrial Pharmacy

I. The Clinical Pharmacy Course

This will embrace all aspects —of:

(A) **Applied Pharmacology as relates to:—**

i. human pharmacology
ii. toxicology — (adverse effects of drugs)
iii. pathology — (abnormal function of cells, etc.)
iv. biochemistry
v. the aetiology of disease and
vi. applied microbiology

(B) **Biopharmacy**

i.e. pharmacokinetics, metabolic chemistry and pharmacodynamics, etc.

(C) **Therapeutics**

II. Pharmacy Administration and Management Course

This course will treat all aspects of Business Management as relates to the general practice of pharmacy i.e.

i. Administration
ii Management — general
iii. Management — personnel
iv. Salesmanship, etc.

III. Academic Pharmacy:—in which the present detailed studies of the formal pharmaceutical subjects will be pursued as at present.

IV. The Industrial Pharmacy Course

Subjects for this course will be:—

1. Pharmaceutical Manufacturing
2. Quality Control
3. Marketing and Representation

I. Pharmaceutical Manufacturing Syllabus: (could include)

i. Basic chemical engineering:— Flow-sheets of the manufacture of the simplier and common pharmaceutical raw materials from both chemical and biological origin.

ii. Formulation of Pharmaceutical dosage forms:—tablets, injections, capsules, syrups and liquids, ointments and creams, suppositories, etc., by which the student is made aware of incompatibilities, standards and good manufacturing practice and the necessity of bioavailability and clinical efficacy of the drugs produced.

iii. Methods of Pharmaceutical development of existing and new products.

iv **Applied Pharmaceutical Chemistry**

(a) pharmaceutical analysis of raw materials and finished products

(b) quality control of packaging materials, etc.,

v. **Applied Pharmacognosy**

(a) Ethnobotany — methods of identification, nomenclature etc., of local medicinal plants.

(b) phytochemistry of local medicinal plants. (Alkaloids, glycosides and their agylcones, bitter principles, volatile oils and terpenes, fixed oils, fats and waxes)

(c) relationship between traditional and modern medicine

vi. **Advertising and Marketing**

vii. Quantitative Management and Statistics.

viii. Labour laws and regulations.

Summary of B. Pharm, proposed course-structure

1st Year	Pharmaceutics
(3 terms)	Physiology
	Biochemistry
	Chemistry
	Pharmacognosy
	Post O-level Mathematics
2nd Year	Pharmaceutics
(3 terms)	Pharmaceutical Chemistry
	Pharmacognosy
	Pharmacology
	Statistics and Business Mathematics
3rd Year	Pharmaceutics
(2 terms)	Pharmacognosy
	Pharmaceutical Chemistry
	Pharmacology
	Forensic Pharmacy
3rd Year	Practical training in on
(1 term)	these Institutions:—
	A registered pharmac
	A hospital pharmaceu department or one i similar institution.
	A pharmaceutical indus
	A school of pharmacy o analytical Laboratory.
4th Year	One from the follo courses:—
(3 terms)	Clinical Pharmacy.
	Industrial Pharmacy.
	Pharmacy Administra and Management.
	Academic Pharmacy.

Any course chosen is taken present Section 'A' of the subject

Pharmaceutics
Chemistry
Pharmacognosy
and Pharmacology.

Howbeit even with this cha far more important than the tion and structure of the cour the quality of the course; i.e. staff who teach it, the staff-stu ratio, and the standard of teac aids available.

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1973—1975

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COMMONWEALTH PHARMACY

I. Australia *

By A. G. Mervyn Madge, F.P.S., F.R.S.H., F.I. Pharm. M. (Member of Council, Pharmaceutical Society of Great Britain.)

The Commonwealth is an association of 33 independent sovereign countries spread throughout the world, embracing nearly a quarter of its population, and characterised by the diversity of race, language, culture and economic development.

Yet despite this diversity—and at times, strong held divergent views—there is an underlying link built on history, long standing contacts, mutual trust and working together.

Nowhere is this more epitomised than pharmacy, which covers all the continents and seas — the highly developed industrialised and the rural peasant economy and culture, the wealthy and poor, the emergent and developing, the well organised profession and the scarcely organised at all. And yet, with all these permutations and combinations, if we stand back and look we find in every one the overwhelming desire to maintain and strengthen the pharmaceutical links to the benefit of all.

The pharmacists of the "new" nations, handicapped by distance and the lack of educational and economic resources, desperately anxious "to catch up," have a great need of help not necessarily financial, from the more integrated industrialised countries of the Commonwealth.

We here in the UK — "this sceptred isle" — tend to look at the world of pharmacy from our highly organised professional viewpoint perhaps not realising that we are still evolving and developing, but the word "pharmacy" can be defined and expressed in many ways depending on the stage of development and economic resources of a country.

A highly qualified pharmacist can be too expensive a luxury and his talents wasted in a rural peasant economy where "dispensers" fill the need and dispensaries are not staffed by pharmacists (who in any case are few and far between) coupled with the "brain drain" to more remunerative countries.

It is hoped in this series of short articles to portray the pharmacy of a country as it is, to show the differences and the underlying problems leading to the resultant policies. By this means knowledge is spread, decisions and actions more easily understood and perhaps unfounded criticism prevented.

One thing will be realised: there is a "brotherhood" of pharmacists throughout the Commonwealth. Though they may never meet, are divided by colour, race, creed, politics and economics, each one in whatever country is endeavouring to serve the public need and health and humanity, to the best of his or her skill, resources and knowledge.

The exact geographical position of some of the Commonwealth countries, especially the emergent, may not be clear in some minds — but there is no doubt, commencing with our schooldays, that the position of this "Island Continent" is quite clear.

But it is not generally realised that, with a population approaching 13 million, mainly derived from English and European ancestry (about 120,000 with 50 per cent Aboriginal blood) residing greatly in urban areas covering 7,686,884 sq km, half of the country is desert or semi-desert.

Our Queen is also Queen of Australia, though with the influx of "new" Australians, the lessening of ties with this country and the closer links with other Pacific facing countries, can give rise to a call for a Republic. It has a Federal system of government with six independently governed states — New South Wales, Queensland, South Australia, Tasmania, Victoria, Western Australia — with two Territories, a Northern Territory and Australian Capital Territory, centred around the capital, which has only a population of Canberra, 156,000 (compared with Sydney 2,717,000 and Melbourne 2,389,000).

Welfare

The Federal budget allocates about 30 per cent to welfare including health and it is interesting to note that old age pensions were introduced in 1909 and maternity sickness.

* First in a series to be published under the auspices of the Commonwealth Pharmaceutical Association.

unemployment and children's allowance have since been added. At present the Federal Health Service is paid out of revenue but this is likely to change to the "British" pattern with contributions from employer and employee.

There are approximately 13,000 pharmacists, the majority being in general practice with 5,000 pharmacies. About 500 are engaged in hospital practice, of which there are 100 hospitals with a pharmacy department. It should be noted that with the Health Service there are reciprocal arrangements with Great Britain and New Zealand.

Each State and Territory has separate legislation covering the recognition of pharmacy qualification with a slight variation from state to state; registration in one state does not automatically give the same in another. Providing the pharmacist is of good character, over 21 (Victoria 18), and not been previously excluded for unprofessional conduct, no difficulty should arise. He or she usually carries a letter of recommendation from the State Board but has to have a photograph sent by this body to prove identity.

Perhaps this method may lie ahead with us now that we are in the EEC, with eventual freedom of movement of pharmacists.

Mending Ways

Pharmacy in each state is controlled by a Pharmacy Board (W. Australia is the exception, where it is a combined function with the Pharmaceutical Society on which there are pharmacists either elected or appointed by the Pharmaceutical Society (in Australian Capital Territory the registering body is the Department of Health) and these Boards are the registering bodies which also have disciplinary powers, the usual procedure being that the Society examines the case first and if thought necessary gives advice "on the mending of the ways."

If it is more serious or the advice not taken, the Pharmacy Board is the next step which can dismiss the case, give a warning, de-register or fine, or both. The final say on appeal is the High Court. De-register can be very serious financially.

In some states the cancellation of the licence to practice can be followed by the compulsory sale of the pharmacy on the grounds that ownership is permitted to pharmacists only.

Widows of pharmacists are not permitted to run the pharmacy on the death of the husband. A special permit is granted to the estate until all formalities are completed and the business sold to another registered pharmacist.

It is also possible for the Commonwealth to withdraw National Health licence from pharmacist guilty of breaches of Commonwealth Law and Regulations. Since about 70 per cent of prescription dispensing is paid from this source the effects can be great.

Drug law enforcement in most States is the province of the Minister of Health as is the scheduling of poisons, issue of licences, etc, by his various departments. These duties for many years were the concern of the Pharmacy Boards but have been gradually taken over. Inspectors need not necessarily be pharmacists.

Every State has a Pharmaceutical Society as a professional association of pharmacists, the main functions being the representation of pharmacy at all levels in the community, the dissemination of information and the watch on the Code of Ethics.

In Victoria State the Society owns and operates the School of Pharmacy. In N.S. Wales and Queensland the pharmacy school is a department in the University.

The other state Societies have affiliations with degree granting bodies.

Study is usually three years full time followed by 12 months in a recognised pharmacy, in some cases hospital or industry, with variation from state to state.

Qualified ownership and conduct of a pharmacy is a fundamental principle of the Pharmacy Boards, and there is a growing adherence to the policy of one man one pharmacy (some states allow one branch) with legislation to prevent further development of multiple ownership and company pharmacy, the latter is now prohibited in all States, those in existence being allowed to remain as such but expansion barred.

Large Chain

There is a large chain — Washington Soul — in W. Australia. Boots have no retail outlets only manufacturing. Standards differ from each state as regards space, dispensing equipment, reference books, etc. There is no pharmacy in supermarkets because of the provision of direct access from the street.

The pharmacist must be present at all times the pharmacy is open including the lunch time if open. The usual hours are from 9 a.m. to 5 p.m. with Saturday closing at 11.30 a.m. Some areas have a rota service when closed but most have an "after hours or night service" pharmacy run by a consortium of pharmacists affected.

Staff work a 40-hour week with about 10 public holidays and eight weeks annual leave, tending now to four weeks. This year will see equal pay for women.

A very strong organisation on the retail side is the Federated Pharmaceutical Service Guild of Australia which represents proprietor pharmacists and negotiates with the Commonwealth Government on all matters concerning the Pharmaceutical Benefits Scheme (the NHS).

The Pharmaceutical Association of Australia is a federal organisation representing all national pharmacy organisations. It is concerned with professional, legal and ethical matters. It has nothing to do with commercial aspects. It embraces the Pharmaceutical Societies, Pharmacy Boards, Pharmaceutical Defence Ltd., and the various sectional associations of pharmacists. Recently the New Zealand Pharmaceutical Society has formed a link to conduct joint conferences.

A pharmaceutical benefits scheme, analogous to our NHS subsidised by the Federal Government, operates in all States and Territories. A wide range of drugs and medicines is available to the public at nominal cost on a doctor's prescription. These are dispensed by the pharmacist at a small fixed charge for each item prescribed, the Government paying the difference between the amount charged and the actual cost of the medicaments. The number or quantity dispensed is limited.

Medicine for pensioners is free but expectant mothers and children pay.

The patient pays one Australian dollar on presenting the script, which is deducted from the pharmacists account when payment is made by the Government. The pharmacist codes the script, the patient signs receipt of medicine, a monthly serial number is added and the script goes to the Ministry of Health which makes use of an extensive computer system. This gives a complete picture each month of the prescribing habits, the amount and type of drugs dispensed, etc, and above all the pharmacist receives payment in the same month.

A survey recently showed that 53 per cent were for drugs of USA origin, 10 per cent Great Britain, and seven per cent Australian.

Doctors only dispense in extreme instances and these are confined to a few remote areas. Hence, to all intents and purposes, dispensing is the prerogative of the pharmacist.

Opium and cannabis are banned and to prescribe heroin and morphine a doctor requires a special permit from the Ministry of Health.

Vets can and do dispense since there is the same problem as in the UK, that some manufacturers restrict their supplies to veterinarians.

Quality

Quality control of new drugs is mainly the responsibility of the Federal Government which maintains a special laboratory for this purpose. Testing and evaluating and registering of proprietary or patent medicines is closely watched in the respective states.

It seems that Australian pharmacy will greatly alter in the next decade or two as the present distribution in the retail side is uneconomic. Planned distribution of pharmacies could be envisaged in some States or a move towards large group pharmacy of professional character — dispensing only.

It is interesting to notice that on Federal land in Canberra two experimental health centres are being tried for evaluation purposes.

It is apparent that there will be larger dispensing units either State run, or State induced to help pharmacists along this path. This is something to which many Australian pharmacists look with apprehension.

THE PHARMACY AND DRUGS ACT, 1961—A SHORT REVIEW

By John Ocran, B. Pharm., Ph.D., MPSG. Department of Pharmaceutics, Faculty of Pharmacy, University of Science and Technology, Kumasi.

Since the Act sets out to control the supply, manufacture, storage and transportation of drugs in Ghana in addition to regulating the profession of Pharmacy we may perhaps start this discussion by first having a closer look at what constitutes a drug. A drug, in this country, means "any substance or preparation used or intended to be used for internal or external application to the human or animal body either in the treatment of disease or for improving physiological functions". I may be wrong but I have a feeling that this definition takes in substances like air, water, kenkey and milk. Surely I do not think this was the intention of the people who drafted the Act but then who will consider their intentions when it comes to interpreting the law?

CLASSIFICATION

The Act divides all drugs into two broad groups—dangerous drugs and exempted drugs. I am not quite sure if the originators meant to divide drugs into the dangerous and the non-dangerous or relatively less dangerous since anything could be dangerous if misused or abused.

Included in the exempted drugs are things like electrical valves, and motor fuels, the latter probably because they improve the physiological functioning of the internal combustion engine!

Then comes the classification of dangerous drugs into classes A,B, & C. I have made a very serious effort to find the basis of this classification but have been forced to give up having convinced myself that there is no rational basis. Perhaps a few examples will support my point: All preparations suitable for intramuscular and intravenous injection are supposed to be in Class A. As far as I know drug researchers have so far not been able to come out with oral preparations of Insulin and yet insulin happens to be classified in group B. Preparations containing 1 per cent or more of strychnine are class A drugs but at the same time the Act says Nux vomica is a class B drug. Why should atropine sulphate, Digitalis glycosides and Ergometrine be in class B while phenolphthalein and phenobarbitone are in class A with the greater restriction on the sale or supply of class A drugs than those in class B? Nobody can explain why the antihistamines should be in both class A & B. It is certain the antimalarials were in use in this country in 1960 but strangely enough this group of drugs has not been included in the classification.

PHARMACEUTICAL SOCIETY

Nobody knows what role the Pharmaceutical Society of Ghana is supposed to play in achieving the aims which Act 64 is meant to achieve because with only three representatives on the Pharmacy Board the society may not be in a position to influence important decisions of the controlling body.

As it is, the Society is forced to admit people into membership after they have been registered as Pharmacists by the Pharmacy Board. There may be occasions when the society may not want to admit an applicant for some good reason, for instance, where there is some doubt about the qualification of the applicant and the Society may therefore want to carry out its own investigation before taking a decision. For an outside body to decide who should become a member of the Society is most unfortunate, to put it mildly. If a member misbehaves the Society cannot expel him or punish him in anyway without reference to the Pharmacy Board.

On the supply of drugs in the country I think if the Society had the necessary powers there won't be such a proliferation of chemical sellers shops in some parts of the country because apart from the dangers created by the chemical sellers their activities are certainly not in the best interest of Pharmacists.

From form No. 8 (Regulation 10) it appears the chemical seller can even start or has to start his business before applying for a licence, "I... address...occupation...being engaged in the business of chemical selling hereby apply for a chemical sellers licence, etc." I wonder if this does not make the licence a mere form-

ality or a means of collecting fees for the government.

RIGHTS OF PHARMACISTS

Admittedly the Act gives Pharmacists the exclusive right to dispense class A and B drugs but even here there are some exceptions which are open to abuse or are questionable. There is nothing wrong in allowing people in the allied professions to dispense drugs in emergency situations or where the surgery is more than five miles from the nearest pharmacy shop but considering that doctors are also allowed to import drugs into the country is it not obvious that the unscrupulous doctor will import large quantities of drugs himself thus ensuring that his prescriptions never get to the pharmacist?

If pharmacists or licensed pharmaceutical companies were the sole importers of drugs they could take steps to prevent a situation where any doctor could turn his surgery into a pharmacy shop. Man being so selfish and greedy by nature, any temptation which will make the doctor think of his pocket and not what is best for the patient should be avoided. Moreover for the development of good relations between the professions it is most essential no party attempts to encroach upon the rights of the other.

DRUG REGISTRATION

At the end of the term of office of appointed members of the Board it may take a considerably long time before new members are appointed. What happens during the intervening period is anybody's guess. The clever businessman can make sure that all his drugs of doubtful value are registered by careful timing of his applications for registration knowing very well that the product has to be registered if the Board has not taken any decision three months after the application has been filed. This may be one of the reasons why so many absolutely useless and sometimes dangerous products are on the market.

It is on record that the present Board was not inaugurated until about three months after the life of the previous one had expired. Drugs are different from other articles of commerce and they should therefore be carefully evaluated before being accepted. The relevant information which will help the Board to make the right decision may take more than six months to obtain in some cases.

COMPOSITION OF PHARMACY BOARD

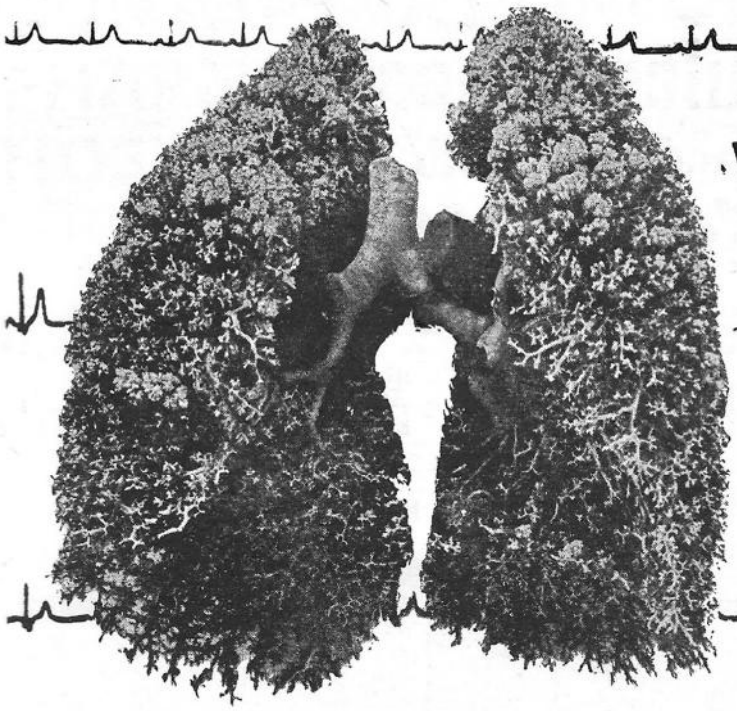
No honest person will disagree with me that the compositon of the Board is an insult to the profession of Pharmacy. In the first place those who drew up the Act should have realised that pharmacy is not an extension or property of the Ministry of Health so there is no sense whatsoever in making the Chief Pharmacist of the Ministry the Chairman of the Board controlling the profession.

I suppose as the head of the pharmacy division of the Ministry the Chief Pharmacist is directly responsible to the Director of Medical Services so he represents the latter's interest and that of the Ministry. Why on earth should the director have to nominate another medical practitioner to serve on the Board? The Pharmaceutical Society of Ghana has never been represented on anybody set up to control the medical profession in this country. This being the case can any body justify the presence of a representative of the Medical Association on the Pharmacy Board? The only medical practitioner whose presence can be justified is the specialist in internal medicine.

The Dean of the Faculty of Pharmacy, U.S.T. may be elected for his academic achievement which may not have any relationship with his professional standing or interest in the advancement of Pharmacy as a profession. After all the University employs academics and not necessarily professionals into academic departments and pharmacy being an applied science, nothing prevents the members of the Faculty from electing a brilliant academic member of staff who is an efficient administrator as Dean though he may not be a pharmacist. Would it not be better to leave representation on the Pharmacy Board to Faculty members to decide? Again, on the chairmanship, is it fair to impose a civil servant on the Board, knowing very well the attitude of most civil servants in this country who want to make sure that they are always "covered", to use their popular term, so that they never accept responsibility whenever anything goes wrong and thereby ensure that no matter who is in power their position is secured? I wonder how the Chief Pharmacist will use his casting vote if at a Board meeting a decision to close down a dispensery in a government hospital without a pharmacist ends in a deadlock after voting!

Do members of the Board realise that they should have banned the sale by retail (not by wholesale!) of anything which comes under the definition of proprietory drug because the Act says that if the use of the drug may endanger health when the recommended dose is exceeded then the product should not be entertained (S 33(b).

I do not claim to have brought out all the shortcomings of the Act in this short article but I hope that by starting this discussion the Pharmacy Board itself will be prompted into doing something to have the Act amended as a supplement to the efforts being made by the Pharmaceutical Society to bring the desired changes. Some members of the Board may not want to see any change since they may lose when the change comes but then if it is in the interest of the country should our conscience not tell us to give our support?



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(Offermeier, J. et al (1972) Med. Proc. **18,** 5).

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EVALUATION OF THE MICROBIAL CONTAMINATION OF PHARMACEUTICALS IN GOVERNMENT HOSPITAL DISPENSARIES IN GHANA

II. Microbial Contamination of Topical Preparations from some Dispensaries

By Boakye-Yiadom, K., B. Pharm. Ph.D., MPSG., and Fokuo, Y. D., M. Pharm., MPSG., Department of Pharmaceutics, Faculty of Pharmacy, University of Science and Technology, Kumasi, Ghana.

SUMMARY

One hundred and eighteen samples of various topical preparations from some Government Hospital dispensaries have been examined to evaluate the degree of microbial contamination. The authors also examined the samples for possible presence in these preparations of the following pathogens- **Staphylococcus aureus, Pseudomonas aeruginosa, Escherichia coli, Salmonellae,** spore forming anaerobic organisms, moulds and yeasts.

INTRODUCTION

Topical preparations because they are usually applied to inflamed areas on the body require in some instances to be sterile and where sterility is not a prerequisite, to be free from undesirable organisms which may otherwise cause damage to the patient (Ridley 1958, Ayeliffe **et al** 1965). A recent report by Boakye-Yiadom and Buadu (1974) showed a very high incidence of bacterial populations and the presence of undesirable pathogens in mixtures prepared in some Ghanaian hospitals which they attributed to poor hygiene in the dispensaries. The present work is the second part of the series in which the microbial contamination of pharmaceuticals in Government Hospital dispensaries in Ghana is being evaluated. The authors have examined some topical preparations from some local Government Hospital dispensaries to assess the degree of microbial contamination.

MATERIALS AND METHODS

Samples were collected from stock preparations into previously sterilized containers. 20 millilitre or 5 gram-samples were taken. Preparations which had been pre-packed in their containers were collected as such.

To determine viable bacterial counts, liquid samples were diluted in quarter strength Ringer's solution to give 1:10, 1:100 and 1:1000 dilutions. One millilitre amounts of these dilutions were plated on nutrient agar. With the powders, one gram samples were suspended in a 100 millilitre quarter strength Ringer's solution. The suspension was diluted to give 1:10 and 1:100 dilutions and 1 ml portions of these dilutions were plated on nutrient agar. One gram of the oily preparation were shaken up in 100 ml of the Ringer's solution with the aid of glass beads. 1:10 and 1:100 dilutions were subsequently prepared and 1 ml portions plated onto nutrient agar. All plates were incubated at 37°C for 48 hours after which counts were made.

To detect the presence of the specific pathogens, enrichment and/or selective media were used; and the methods and media used were the same as those used by the working party of the British Pharmaceutical Society (Sykes **et al** 1971).

To determine the presence of spore forming anaerobes, the samples were heated at 65°C for 1 hour. 1 ml/50 mg portions were then innoculated into thioglycolate medium and incubated at 37°C for 7 days.

Yeast and mould were detected using malt agar at 22°C for 7 days. Oxoid media were used in the exercise.

RESULTS AND DISCUSSION

The results of the viable count on the various products are summarised in table 1. Of the twenty four (24) eye-drops samples examined twenty (20) were sterile, the four (4) unste-

TABLE I: VIABLE BACTERIAL COUNT

Product	No. of Samples Examined	% of Samples Sterile	% with Count Less Than 1,000/ml/gm	% with Count Between 1,000-10,000/ml/gm	% with Count Between 10,000 100,000/ml/gm	% with Count Greater Than 100,000 ml/gm
Eye-Drops	24	83.3	16.7	—	—	—
Nasal Drops	20	—	100	—	—	—
Ear-Drops	20	—	95.0	—	5.0	—
Mouth Wash	12	—	—	—	—	100
Calamine Lotion	10	70	—	30	—	—
Dusting Powder	12	—	—	25	8.3	66.7
Cord Powder	10	90	—	—	10	—
Creams/ Ointments	10	—	—	20	70	10

TABLE II: PRESENCE OF SPECIFIC PATHOGENS EXPRESSED AS A % OF SAMPLES EXAMINED

Product	S. aureus coagulase Positive	S. aureus coagulase Negative	E. coli	Ps. aeruginosa	Salmonallae	Spore-forming aerobes	Moulds/ Yeasts
Eye-Drops	8.3	12.5	—	4.2	—	—	—
Nasal Drops	30.0	40.0	20.0	20.0	—	—	—
Ear-Drops	40.0	70.0	—	10.0	—	—	—
Mouth Wash	41.5	74.7	16.7	—	8.3	16.7	—
Calamine Lotion	—	—	—	30.0	—	20.0	—
Dusting Powder	8.3	41.5	25.0	—	—	33.2	25.0
Cord Powders	—	—	—	—	—	10.0	10.0
Creams/ Ointments	10.0	70.0	—	30.0	—	—	40.0

rile samples showed a count of less than 1,000 organisms per millilitre of solution. All twenty (20) nasal-drops samples showed a count of less than 1000 organisms per millilitre of sample. Nineteen (19) of the twenty ear-drops-samples showed a count of less than 1000 organisms per millilitre and the remaining sample had a count of between 10,000 and 100,000 organisms per millilitre, of solution. All the twelve mouth wash products had a count of more than 100,000 organisms per millilitre of solution. Seven (7) of the ten calamine lotion samples examined showed no microbial contamination, the remaining three had a count of between 1,000 and 10,000 organisms per millilitre of solution. Three (3) of the dusting powder samples showed counts of between 1,000-10,000 organisms per gram of powder, one sample showed a count of between 10,000 and 100,000 organisms per gram and the remaining eight samples had over 100,000 organisms per gram of powder. Only one of the ten cord powder samples was contaminated and showed a count of between 10,000 and 100,000 organisms per gram. All ten cream/ointment samples showed various degree of contamination; two (2) samples had a count of between 1,000 and 10,000 organisms per gram, seven (7) had a count of between 10,000 and 100,000 organisms per gram and the remaining sample showed a count of over 100,000 organisms per gram of sample.

The summarised results of the test for the presence of specific pathogens are presented in table II.

Generally the microbial contamination of the samples examined were low. Four of the eye-drops samples which were found to be contaminated, might most likely have been contaminated during dispensing of the drug which was prepared and sterilised in bulk and then dispensed into pre-sterilised injection vials due to lack of appropriate containers.

Samples taken from the stock eye-drops solutions were found to be sterile. The nasal and ear drops showed low count probably because of the presence of preservatives. The mouth-wash samples, the dusting powder samples and aqueous creams showed high bacterial populations which the authors believe could have been due to high contamination of the raw materials used in their preparation. Tests for specific pathogens showed that staphylococci were the common contaminants, strains of staphylococci have been found to be the most common contaminants of local hospitals (Boakye-Yiadom, 1974). It is interesting to note that only one sample from the eye-drops was contaminated with Pseudomonas aeruginosa, an undesired pathogen in eye-drops. Three samples each of the calamine lotion and the creams also contained pseudomonas. The mouth-wash samples which were the most heavily contaminated, had five (5) samples containing **E. coli** and one sample being positive for Salmonellae. Spore-forming anaerobes and mould and yeasts were found in only approximately 7 per cent of the products examined which is not very significant except that 33 per cent of the dusting powder samples contained anaerobic spore-formers. The authors believe that improvement in the level of hygiene and storage facilities of the dispensaries could drastically cut down the number of organisms present in most of the products prepared in these dispensaries.

ACKNOWLEDGEMENTS

The authors wish to thank Messrs. Mike Pobee and Charles Manful for technical assistance and Mr Yaw Owusu Ansah for typing the manuscript.

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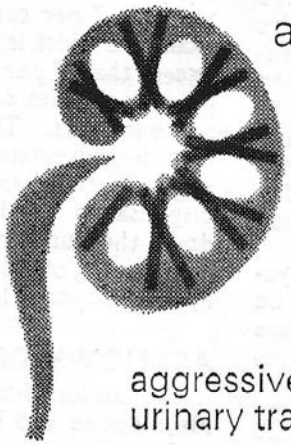

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How Supplied: Buff-colored scored tablets of nalidixic acid, 500 mg., for adults, in bottles of 56 (sufficient for one full week of therapy).

References: 1. Bush, I. M.; Orkin, L. A., and Winter, J. W., in Sylvester, J. C.: *Antimicrobial Agents and Chemotherapy*—1964, Ann Arbor, American Society for Microbiology, 1965, p. 722. 2. Robertson, M. H.: Antibiotic resistance patterns of organisms causing acute urinary tract infections occurring in general practice, *Brit. J. Clin. Pract.* 22:63-67, Feb., 1968.

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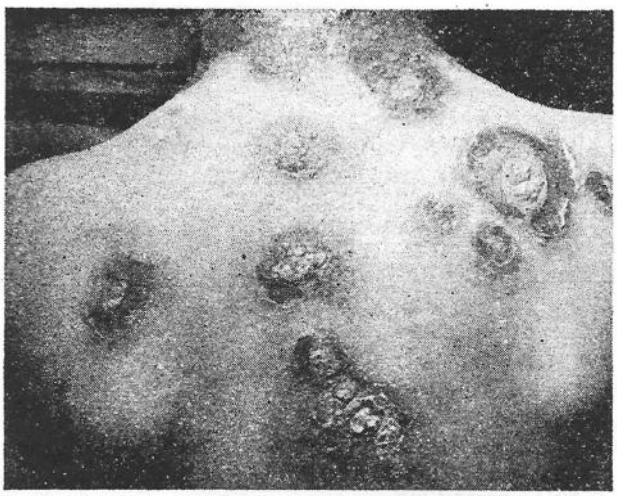
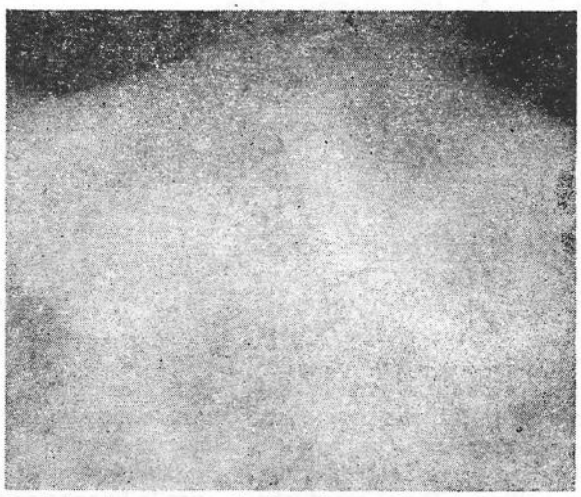


1. Impetigo caused by staphylococcus aureus on chest and back of a four-year old boy.



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THE PROSTAGLANDIN STORY

By T. L. Bernasko, B. Pharm., MPSG., Upjohn (Nigeria) Ltd., Lagos.

In the past century, the practice of medicine and pharmacy has been revolutionalized by the development of powerful chemical weapons against disease and through this period has been the advent of the discovery and isolation of insulin and sex hormones, the chemotherapeutic era of the sulphurs leading to the giant strides of the penicillins. Then came the corticosteroids, the tranquilizers, the antitubercular drugs and the others until the 1960's when the oral contraceptives with their world-wide clinical and social repercussions were introduced.

It takes no crystal ball expertise to foresee that the 1970's may well become the decade of a new group of hormone-like chemicals called the prostaglandins. prostaglandins are naturally found in almost every cell and tissue where they exert broad regulatory functions in relation to smooth muscles activity, secretion and blood flow. They comprise a closely related family of fourteen substances which appear to be manufactured in the cell membrane out of fatty acids. In fact all prostaglandins are structural derivatives of prostanic acid — a 20-carbon carboxylic fatty acid. Production of prostaglandins can be set off either by muscle stretching or contraction, by injury to the cell, or by the various glands. Inside the membrane the prostaglandins act as a crucial signal transmitter, an on-and-off switch, that passes the hormonal or other messages into the cell.

The prostaglandins are named by letters "A," "B," "E" and "F" designating the four types each with common structural features. The types are further sub-divided with numerical and Greek letter subscripts. Research has concentrated on five of the family members— prostaglandin A_1 A_2 E_1 E_2 and F^2 alpha as the most pharmacologically active. F_2 alpha and E_2 are already in clinical use in Europe and are being tested in U.S. for inducing labour at term and for terminating pregnancy. Being so critically involved in the exquisitely regulated mechanism of cellular metabolism the prostaglandins are also effective in controlling an astounding range of ailments. Conditions including asthma, high blood pressure, excessive gastric secretions that can lead to ulcers have been successfully treated with prostaglandins in clinical trials.

The prostaglandins fairly-tale versatility is precisely what long discouraged most companies from investing in their development as drugs. In spite of this, the first prostaglandin has been marketed in England for induction of labour. Some researchers are also working on analogues or antagonists of prostaglandins. The analogues may improve stability of the drug since the naturally occurring prostaglandins are quickly inactivated by body enzymes whilst the antagonists may be used in preventing premature labour or may open a new approach to the treatment of arthritis and other inflammatory conditions.

Discovery and Development

The prostaglandin story starts more than 40 years ago when two New York gynaecologists R. Kurzrok and C. L. Lieb found that some unidentified substance in human semen could stimulate strips taken from the smooth muscles of the uterus. A few years later, physiologist Ulf von Euler of Stockholm and a British researcher M. W. Goldbalt independently showed that the unknown substance caused many other smooth muscles to contract and also lowered blood pressure in animals. Believing that the substance came from the prostate gland, von Euler named it prostaglandin. (This turned out to be a misnomer, since prostaglandins are manufactured throughout the body, but the name stuck). After much difficulty in isolating the prostaglandin because of the lack of analytical methods and inadequate supplies of the raw materials, a researcher called S. Bergastrom was given a grant of $100,000 by Upjohn Company. He succeeded in 1962 in determining the precise chemical structure of the prostaglandin compounds. This brilliant achievement was followed by the emergence of another prostaglandin Scientist — Dr. B. Samuelson who isolated and determined the structure of eight naturally occurring derivatives of the six primary prostaglandins in human seminal plasma. In 1964 almost simultaneously Upjohn, Unilever and Kalolinska each devised a way of imitating the natural synthesis of prostaglandins by incubating its fatty-acid precursors with animal vesicular glands.

Clinical Possibilities

Female Reproduction:—More than 40 years after gynaecologists Kurzrok and Lieb reported the effects on human uterine tissue of what were undoubtedly seminal prostaglandins—although the substance were unknown to them — prostaglandin research has come full circle. Appropriately it is as regulators of human reproduction that the prostaglandins are making their first entrance into clinical medicine.

There is impressive circumstantial evidence that PGs participate in every phase of the reproductives process although their precise role is unknown. The abundance of the substance in human semen and their presence in menstrual fluid have already been noted.

Starting in 1966, the brilliant pioneer investigator, Makerere University's Dr. Karim and his co-workers discovered prostaglandins in human umbilical cord and placental blood vessels, in amniotic fluid and decidua, and in maternal venous blood during labour and spontaneous abortion. Karim found a correlation between the levels of PGF_2-Alpha during labour and uterine contractions, and suggested a physiological role for this compound in parturitien.

In vitro and animal studies had already indicated the possibilities of prostaglandins in influencing human reproduction. Preliminary human studies by Dr. Marc Bydgeman of the Karolinska institute and his co-workers had shown PGE_2, PGF_1-alpha and PGF_2-alpha stimulate the pregnant uterus to contract at all stages of gestation.

The next step was the first clinical trial, undertaken by Karim in 1968, of PGF_2-alpha and induction of labour at term. In that year and the next he and his colleagues reported on 100 women who received infusions at 5 to 10 ug/min. to induce labour at or near team.

"In the 91 women in whom labour was successfully induced with PGF_2-alpha infusion," wrote Dr. Karim, "the average induction-delivery interval was 17 hours. Uterine activity was continuously monitored in all these patients and the pattern of contractility was similar to that of normal labour. There were no side effects which could be ascribed to PGF^2-alpha infusion and all infants at birth were in good condition."[1],

This was a major breakthrough, not so much because of the particular indication involved oxytocin is also an effective inducer of labour at term — but viability of any of the prostaglandins. The compounds were beginning to fulfil their promise. Soon reports came from Bygdeman's group in Sweden, from investigators, in England, the United States and other countries confirming the effectiveness of PGF_2-alpha for inducing labour at term.

PGF^1, and especially PGE_2 also got into the act. Again Karim and his co-workers were first to report. In a series of 50 women they achieved 100 per cent success with PGE_2 at the astonishingly low infusion rate of 0.5 ug/min. although some women had to get a second infusion the following day.

In the past few years thousands of women, participating in clinical trials in several countries, have given birth with the aid of either PGF_2-alpha or PGE_2. In the hospital of Makerere University Medical College the use of these PGs has become standard procedure. The United Kingdom is the first country to have them available for in-hospital use.

Karim and gynaecologist S. D. Shama also demonstrated that the two PGs can be effective orally. In a study of 100 women, they administered PGE_2 at 0.5 to 2mg every two hours until labour was established. Of the 80 patients who received PGE_2, there was only one failure but there were four failures among the 20 who received PGF_2-alpha. Later studies-indicated that the only-serious side effect attributed to prostaglandins was vomitting in one to two per cent of women. The Uganda investigators have also successfully induced labour with 2mg of PGE_2, or 5mg of PGF_2-alpha administered vaginally every two hours.

Do prostaglandins have advantages over oxytocin for stimulating labour at term? Comparative double-blind trials have left the matter in dispute, especially since the studies have not been uniform in design and in criteria employed. The short-comings of oxytocin are well-known. Wide variations of dosage from patient to patient are required and the infusion must be carefully titrated to avoid tetanic contractions (muscles spasms) or tumultuous labour that could cause fatal distress or uterine rapture. Oxytocin is also unsuitable for Rh-sensitized mothers or those with precolamptic toxemia, and its antidiuretic action makes it a hazard for women with renal or cardiac disease. With prostaglandins available, physicians can choose whatever they consider best for the patient.

Of even greater potential significance is the use of certain prostaglandins as abortifacients. Oxytocin in ineffective for this purpose, and the risks from surgery or hypertonic saline are not inconsiderable. The medical world greeted with great interest the first report by Karim and Dr G. M. Filshie in 1970 of successful pregnancy termination in 13 of 14 women with PGF_2-alpha infusion at the rate of 50 ug/min. and in eight of eight women with PGE_2 infusion at one-tenth that rate. The gestation period ranged from nine to 22 weeks, and the infusion continued for as long as 48 hours when necessary.

Reports by other investigators confirmed the effectiveness of the two PGs although the success rate varied with the dosage and the length of time allowed for expulsion of the conceptus. However, all reports revealed that with the relatively high doses required to interrupt pregnancy — about 10 times those for induction of labour at term — distressing side effects such as nausea, vomitting, diarrhoea, erythematous reaction at the infusion site, and sometimes tachycardia pyexia and vasovagal symptoms were frequent.

In an effort to overcome these problems, investigators began to explore other routes of administration. Sweden's Nils Wiqvist and Bygdeman found the intrauterine method promising. They injected 25 to 75 ug of PGE_2 or 200 to 200 ug of PGF_2-alpha intermittently into the uterine cavity between the foetal membrane and the uterine wall. They reported success in 11 of 12 women who were five to 13 weeks pregnant. The total prostaglandin dose was only one-tenth that by the intravenous method, and side effects were substantially reduced.

Dr M. P. Embray of the University of Oxford and his associates also reported favourable experience with the intrauterine route. Of 94 patients, most of them in the second

33RD GHANA PHARMACEUTI

AUGU

THEME: **"PHARMACEUTICAL INDU**

VENUE: **CONFERENCE**

PROC

THURSDAY 28TH AUGUST

5.30 p.m. Official opening of Conference and Exhibition
By Lt.-Col. P. K. D. Habada, Greater Accra Regional Commissioner.

7.00 p.m. Cocktails at the Forecourt, State House.

FRIDAY 29TH AUGUST

8.30 a.m. Registration of Conference Participants.

9.00 a.m. Presentation of Papers:

i) "Effects of heat on Dissolution Rates of some Tablet Formulations"
By J. Y. Binka, B.Pharm., M.Sc., MPSG., Chemical Laboratories, Ghana Standards Board, Accra.

ii) "Higher Plants as possible commercial Sources of Antibiotics"
By K. Boakye-Yiadom, B.Pharm., Ph.D., MPSG., Dept. of Pharmaceutics, UST, Kumasi.

iii) "Shea Butter — Has it a place in Industrial Pharmacy?"
By G.H. Konning, M. Pharm., Ph.D., MPSG., Dept. of Pharmaceutics, Faculty of Pharmacy, U.S.T., Kumasi.
Chairman: Prof. D. K. Santra, Ph.D., Head of Department of Pharmacognosy, Faculty of Pharmacy, U.S.T., Kumasi.

10.15 a.m. Coffee Break and visit to Exhibition.

10.30 a.m. First Business Session:
Hon. General Secretary's Report.
Hon. Treasurer's Report
Appointment of Working Committees.

12.30 p.m. Lunch Break.

2.00 p.m. Second Business Session:
Open Forum — Discussion of Reports.

5.00 p.m. Tea Break and visit to Exhibition.

ONFERENCE AND EXHIBITION

-30, 1975

AND THE NATIONAL ECONOMY"

STATE HOUSE, ACCRA

AMME

5.30 p.m. Guest Address: "The Pharmaceutical Industry"
By the Guest Speaker, Mr C.C. Stevens, OBE, LLB., FPS., Immediate Past President, Pharmaceutical Society of Great Britain.

Chairman: Mr J.K. Rockson, President, Ghana Manufacturers' Association.

SATURDAY 30TH AUGUST

9.00 a.m. *Symposium:* "Problems facing the Pharmaceutical Industry."

Panelists:

1. Mr F. M. Dickson, B.Pharm., MPSG., Intravenous Infusions Ltd., Koforidua,—"Manufacturing Problems."
2. Mr Youssef Daoud, Plant Manager, Pharco (Laboratories) Ltd.—"Pharmaceutical Plant Management in relation to other Internal Departments in an Industry."
3. Mr Abraham Gyesie, B.Pharm., MPSG., Sandoz (Nigeria) Ltd., Lagos.—"Generic Inequivalence and Pharmaceutical Piracy."

Chairman: Prof. E.A. Gyang, B.Pharm., M.Sc., Ph.D., MPSG., Dean, Faculty of Pharmacy, U.S.T., Kumasi.

10.30 a.m. Coffee Break and visit to Exhibition.

11.00 a.m. Third Business Session:
Reports from Working Committees.
Group Photograph

12.30 a.m. Lunch Break.

2.30 p.m. Fourth Business Session:
Passing of Resolutions

4.00 p.m. Coffee Break and visit to Exhibition.

4.15 p.m. Fifth Business Session:
Election of Officers for 1975 — 77.

Chairman: Mr C.U. Efobi, President of the Pharmaceutical Society of Nigeria.

trimester, who received either PGF_2-alpha or PGE_2, 82 (87 per cent) aborted successfully within 36 hours. The success rate of the two lipids was virtually identical, but PGE_2 had the edge in average induction time: 19.5 hours compared with 24.1 hours for PGF_2-alpha. Vomitting occurred in 25 patients, nausea in four and diarrhoea in two.

Vaginal administration has been tried by several groups. Karim and Shama reported minimal side effects in 45 women who received intravaginally either lactose tablets or pessaries of 50 mg. of PGF_2-alpha or 20 mg. of PGE_2 every two-and-a-half hours. Other investigators encountered considerably more side effects by this route.

The Uganda researchers regard as the most promising method of interrupting pregnancy in the second trimester the injection of prostaglandin into the amniotic sac. They found that a single injection of 5 mg of PGE_2 or 25 mg of PGF_2-alpha terminated pregnancy in 10 of 10 women. Vomitting and nausea were the only side effects, and some patients had none.

These results were confirmed in a larger study of PGF_2-alpha by Dr. Gerald G. Anderson of Yale University and his colleagues. They boosted the dose to 40 mg and achieved 26 complete and nine partial abortions in 35 women.

The World Health Organization (WHO) has sponsored collaborative studies by centres in various countries of the intrauterine and intraamniotic use of PGF_2-alpha as an abortifacient. The WHO Research and Training Centre on human Reproduction at the Karolinska Institute has developed protocols for these studies and held several international conferences.

For interruption of second trimester pregnancy the PGs has distinct advantages over the risky alternatives hitherto available: intraamniotic administration of hypertonic saline or hysterectomy. Analogues of PGs offer the possibility of further curbing side effects. After being successfully tested in rhesus monkeys by Upjohn's Dr Kenneth T. Kirton and his coworkers, 15 methyl-PGF_2-alpha and 15-methyl-E_2-emthyl ester are being evaluated by several investigators for inducing labour and for terminating pregnancy in humans.

Beyond the purely medical aspects, the subject of therapeutic abortion is one highly charged with social, ethnical and religious implications in many parts of the world, including the United States. The trend in recent years has been toward liberalizing laws and making the procedure more widely available as a means of ending unwanted pregnancies in this context, efficacy and safety point to an important role for prostaglandins.

Of even greater potential significance is the use of certain prostaglandins as contraceptives. The "Pill" and the intrauterine device are highly effective and have become powerful instruments of family planning. But they have drawbacks, particularly for those who are most in need of controlling the number of their children: women in the developing countries and in the poverty areas in the United States and other developed nations.

In 1970 Wiqvist and Bygdeman reported the possibility of using PGF_2-alpha as a contraceptive agent before clinical signs of pregnancy appear. In a small number of women who use no other contraceptive, they administered the compound by intravenous infusion a few days after they missed menstrual period. Bleeding was induced two to three hours after the infusion began.

Karim also tried both PGF_2-alpha and PGE_2 in 12 women of proven fertility who had had unprotected intercourse and had missed their periods by two to seven days. In eight of the women the Prepurex (Wellcome) immunologic test for pregnancy was positive. Two lactose tablets, each containing either 20 mg of PGF_2 or 50 mg of PGF_2-alpha, were administered intravaginally four hours apart. Menstrual-like vaginal bleeding was induced in 11 of the 12 women. The bleeding lasted three to four days and was described by most of the women as similar to their menstrual periods.

The prospect that prostaglandins may provide a safe, self-administered once-a-month means of preventing pregnancy has stirred great interest. In practice a woman would have to use this method only three or four times a year after a missed period, thus avoiding possible toxic effects that might be associated with chronic use.

PG potential for "hindsight" fertility control has attracted research support from the U.S. Agency for International Development (AID). In the opinion of Dr. R. T. Ravenholt, director of the AID Office of Population, prostaglandins "might mean as much in controlling the reproductive process as the introduction of penicillin meant in fighting infection."

All this is still prologue, and realization of these possibilities cannot be considered imminent. Much more information is required about mechanism of action of the PGs, their absorption and metabolism, and their local toxic effects. And more extensive clinical study of PGF_2-alpha, PGE_2 and analogues will be necessary before it becomes possible to introduce prostaglandins as post-implantation contraceptives.

Male Fertility:

At least 13 of the 14 known prostaglandins occur in human seminal plasma, which contains 100 times as much of these lipids as any other tissue or fluid. A possible correlation between PG concentration in human seminal fluid and male fertility was suggested as early as 1947. However, it was not until more than 20 years later, when the techniques have been developed to analyse and quantitate prostaglandins, that Swedish investigators Bygdeman and Samuelson found evidence of such a correlation.

In a study of semen samples from 146 men they reported that those in infertile marriages had significantly lower concentrations of prostaglandins compounds than samples from men with documented fertility. Semen samples of 40 per cent of the men in functionally infertile marriages averaged a prostaglandin content of less than 15 ug/ml, compared with 55.2 ug/ml for those men of normal fertility. And none of the latter had a content below 15 ug/ml. This suggests the possibility of facilitating conception in some infertile marriages by intra-vaginal administration of prostaglandin compounds. Clinical trials are being used to test the validity of this procedure.

There is also the possibility that aspirin and other anti-inflammatory drugs which can block PG production, may be the culprits in some cases of male infertility. A study in a small number of subjects indicated that aspirin reduced the concentration in human semen of PGE_2 and PGF_2-

alpha, the only ones whose changes were measured.

Seminal prostaglandins may also play a role in ejaculation, in sperm transport, sperm capacitation, and fertilization. Back in the 1930's von Euler suggested that prostaglandin, which he then believed was a single substance could stimulate emptying of the genital glands when the substance had accumulated sufficiently. More recently the co-discoverer of prostaglandins, who still keeps his hand in the field, said: "Equally possible is an effect in the receiving part that would induce in the smooth muscle of the uterus an activity pattern useful for the transport of the deposited material. Should both these possible effects be proved, we have in prostaglandins unique hormones, dividing their activity between two different organisms to facilitate reproduction."[2]

ULCERS:

One of the most important clinical implications of certain prostaglandins is the promise they hold for preventing and treating peptic ulcers. Studies of intravenous infusion of PEG_1, PGE_2, PGA_1 and PGA_2 in man show a reduction of these as well as stimulated gastric secretion. Clinical trials in patients are under way to determine the usefulness of one or more of these agents in peptic ulcer therapy. Diarrhoea has been the only serious side effect encountered, but careful titration of dose or use of analogues might remedy this.

Cardiovascular:

Clinical development of prostaglandins for treating hypertension has focused on the A group. The E compounds, which also lower blood pressure, are quickly inactivated by the lungs, whereas PGA_1 and PGA_2 are capable of longer activity. They also have the added virtue of not stimulating nonvascular smooth muscle of the intestinal and genitourinary tracts. A prostaglandins lower blood pressure in hypertensive patients by dilating small peripheral arteries associated with an increase in cardiac output secondary to reflex acceleration in the heart rate.

Although PGA_2 occurs naturally in the kidney medulla, the closely related PGA_1 acts similarly. Several groups of investigators have confirmed the anti-hypertensive action of PGA_1 in patients. In one study reported in 1971, Dr. Lee and his colleagues tried two different infusion rated in six patients with moderately severe essential hypertension, there were significant differences in results.

At low rates (0.1 to 2.1 ug/kg/min) for 30 minutes there was no change in blood pressure, but the kidney was the scene of much activity: significant increases in effective renal plasma flow (ERPF), glomerular filtration rate (GFR), urinary flow, urinary sodium and potassium excretion. During the next 30 minutes infusion rates were raised to 2.1 to 11.2 ug/kg/min. Blood pressure fell from a control averaged to 205/112 mm Hg to 140/85 mm Hg. But the renal action went into reverse, ERPF, GFR, urinary flow, and sodium and potassium excretion dropping to or toward preinfusion levels. Reported the St. Louis University team: "The present study reveals that infusion of PGA_1 into patients with essential hypertension leads to a complex series of events involving initially the kidney and culminating ultimately in the establishment of a lowered blood pressure without a compromise in renal plasma flow and sodium and water excretion."[3]

Dr. Lee and his co-workers regard PGA_1, as an "ideal" antihypertensive agent, but for clinical use a longer acting analogue, preferably one effective orally, would be required. Such analogues are in process of development. The renal effects of the A compounds also suggest possible clinical utility in kidney failure.

In another area, the inhibitory effect of PGE_1 on platelet aggregation seems to have yielded practical benefits. Drs. Peter W. Ramwell and Hidea Shio of the Alza Corporation demonstrated that PGE_1 improves the preparation from whole blood or platelet-rich plasma of human platelet concentrates, which are useful in treating hemorrhage due to blood platelet deficiency. Based on these studies, clinical trials have shown that addition of this PG to blood collection bags has prevented clumping of platelets and significantly improved separation of blood components.

This raises a much larger question: Can PGE_1 be of value in treating and preventing thrombosis and atherosclerosis? The answer will not come easily or quickly. In experimental animals, blood samples withdrawn after administration of PGE_1 show inhibition of platelet aggregation. Topical application or intravenous administration of PGE_1 also suppresses white thrombus formation in injured animal blood vessels.

In human volunteers, however, infusion of the compound at the rate of 0.2 ug/kg/min. for periods of up to 15 minutes failed to indicate an effect on platelet aggregation. This may have been due to insufficient levels of prostaglandin since the cardiovascular and other consequences of higher infusion rates are difficult for human subjects to tolerate. Some PG analogues with selective action might in the future solve this problem and open the way to clinical evaluation.

Asthma:

Preliminary studies have indicated the potential medical value of certain prostaglandins in treating asthma. Using PGE_1 in aerosol form, Dr. M. F. Cuthbert of London Hospital Medical College found that 55 ug produced an increase in forced six piratory volume in five out of-ixm asthamatic volunteers — comparable in degree and duration to that of 550 ug of isoproterenol sulphate. European investigators H. Herxheimer and I. Roestscher obtained similar results with PGE_1. Larger clinical trials are planned to determine whether this prostaglandins or some variant has practical value in the therapy of asthma.

Stroke and Shock:

Animal studies indicate a potential role for some PGs in treating stroke and shock. University of Oklahoma investigators have found PGE_1 effective in relieving intracranial arterial spasm in experimental-subarachnoid hermorrhage in baboons. After vasospasm had been documented by angiography, PGE_1, administered in the right external carotid artery, significantly increased carotid blood flow and alleviated spasm in five of the seven animals. In the other two, only relatively large doses of prostaglandin substantially increased carotid flow on the side of administration. PGE_1's ineffectiveness in these baboons correlated with the absence of clinical symptoms: spasm could not be demonstrated in these two animals angiographically or by decreased cartoid flow.

In experimental shock, it is PGF_2-alpha that plays the therapeutic role. After subjecting two groups of cats to lethal hemorrhagic shock procedure, Dr. Thomas M. Glenn of the Medical College of Pennsylvania infused PGF_2-alpha in one group and left the other untreated. The survival time of the treated group was significantly prolonged as compared with the controls. Various hemodynamic and biochemical parameters also indicated benefits for the treated animals.

Dietary Deficiency

Is there a future for some prostaglandins in dietary deficiency diseases? This is a particularly intriguing question since the essential fatty acids that are the precussors of PGs play an important role in nutrition. Rats fed of at-free diet develop skin lesions, become stunted in growth and are unable to reproduce. They can be cured by feeding them those fatty acids that are PG precussors. But effort to treat such rats with prostaglandins have produced no visible effect. Nonetheless, there may be some complex, as yet undiscovered role that prostaglandins play in-nutrition, opening the possibility of their therapeutic use in dietary deficiency.

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THE DANGERS ASSOCIATED WITH THE MISUSE OF ANTIBIOTICS AND HOW BEST TO EDUCATE THE GENERAL PUBLIC AS PHARMACISTS*

By K. A. Ohene-Manu, B. Pharm., MPSG., M.I. Pharm. M., Glaxo-Allenburys (Ghana) Limited, Accra.

Mr Chairman, Distinguished Guests, Members of the Ghana Pharmaceutical Students' Association, Ladies and Gentlemen,

I will first of all wish to thank the Chairman for those kind words said about me and to express my sincere gratitude to the Executive Committee of the Ghana Pharmaceutical Students Association for inviting me to give the guest lecture at their 1975 "Pharmacy Week Celebrations."

I am happy to accept this invitation this time especially since other commitments did not permit my accepting similar invitations extended to me by the Association previously.

It is my understanding that the theme for this year's Pharmacy Week Celebrations is "You and your Drug" and the title of my talk is "The Dangers associated with the misuse of antibiotics and how best to educate the general public as pharmacists." In discussing this topic, I intend to define briefly the term antibiotics, and describe their normal uses before dealing with the problems attendant to even their legitimate use, the dangers and complications which could arise out of their misuse, and how misuse of antibiotics arises before making suggestions as to how this problem can be avoided.

ANTIBIOTICS:

An antibiotic was originally defined as a substance produced by one micro-organism which inhibits the growth of, or destroys another micro-organism. The term has become stretched to include synthetic and semi-synthetic chemical substances having similar action. The elucidation of the chemical structures of the natural antibiotics has allowed the synthesis of related antibiotic substances which possess additional properties or are therapeutically more effective and less toxic. The use of antibiotics began in 1941 with the introduction of the antibiotic Penicillin and since 1941, the number of antibiotic substances (natural, semi-synthetic and synthetic) discovered extends into several hundreds. These substances differ widely in their physical, chemical, and pharmacological properties, their antimicrobial spectra and their mechanisms of action. A detailed survey of such products which are not drastically limited in scope would be far too large a task to ever allow completion and therefore, in discussing antibiotics today, it is my intention to limit myself to only the antibiotics commonly used in this country.

USES OF ANTIBIOTICS:

Antibiotics are normally used clinically when a patient has an infection that is when the body's own defence mechanism fails to eradicate invading disease-causing micro-organisms, or pathogens. Prior to the introduction of antibiotics the only reasonable tool available to treating infections were sulphonamides and there is every evidence that with the advent of antibiotics there has been marked reduction in the morbidity and mortality of many hitherto fatal diseases.

When a clinician is confronted with a patient suffering from an infection, he faces the problem of deciding which antibiotic to use since, as I said earlier, there are several antibiotics from which he could make a choice. Some antibiotics are broad-spectrum, others are narrow-spectrum and antibiotics are often thus classified to indicate the range of organisms against which

* Guest Speech at the 1975 "Pharmacy Week" celebrations of the Ghana Pharmaceutical Students' Association, at the Univesity of Science and Technology, Kumasi, February 10, 1975.

they exert effect. The narrow-spectrum antibiotics are those whose action is restricted to relatively few organisms usually the gram positive ones, an example of such antibiotic being Penicillin. On the other hand, broad-spectrum antibiotics are those active against a wider range of organisms, usually both gram positive and gram negative—examples—Tetracyclines, Ampicillin, Cephalexin, Cephaloridine and Chloramphenicol.

In addition to this division of antibiotics on the basis of their spectrum of activity, all antibiotics can further be devided into two, based on their antimicrobial action in their therapeutically acceptable concentrations—(1) *bactericidal* antibiotics which kill the organisms by inhibiting synthesis of their cell wall or cytoplasmic membrane (e.g. Penicillin, Streptomycin, Cephaloridine, and Neomycin). (2) *bacteriostatic* antibiotics which *reversibly inhibit* the growth of the organisms by preventing protein biosynthesis, (e.g. Chloramphenicol, Tetracyclines and Lincomycin). It should be noted that under normal circumstances since bacteriostatic antibiotics merely reversibly inhibit the growth of the pathogens, they tend to produce resistant strains and mutants whereas this is less likely to happen with a bectericidal antibiotic. I would mention here that this classification of antibiotics into bacteriostats and bactericides are not absolute since an antibiotic which is bactericidal in a certain concentration can act as a bacteriostat at lower concentrations. The maintenance of bactericidal effect therefore, depends on adequate dosage and tissue penetration.

Before a clinician prescribes an antibiotic, he has several options and under ideal conditions, his choice should be made on the results of sensitivity tests carried out on specimens from the patient. In practice, this does not often happen and some doctors in this country tend to prescribe broad-spectrum antibiotics for infections which could have responded to a simple narrow-spectrum antibiotic. Normally, however, the severity of the infection and the state of the patient influence the choice of antibiotic, its route of administration and whether or not a bactericidal or bacteriostatic effect is desired. Severe infections usually require bactericidal agents by the parenteral route. To sum up the uses and choice of antibiotics then, before any antibiotic is administered to a patient the clinician makes (or must make) a rational selection of the antibiotic to be employed and must decide, on the basis of the infection to be treated, what constitutes an adequate dosage, and the duration of treatment.

Having reached these decisions, the clinicial must then decide whether there is any danger to the patient involved in the proposed therapy since it is known that the use of every antibiotic (and for that matter every drug) has certain attendant dangers.

ADVERSE EFFECTS OF ANTIBIOTICS

(*a*) The Penicillins, including Ampicillin, are known to illicit hypersensitivity reactions which may manifest themselves as rashes (urticaria) angioneurotic oedema, fever, and occassionally, severe allergic reactions which may be fatal do occur. These effects are more common in persons who have become hypersensitised to penicillin after a previous exposure, especially after topical therapy;

(*b*) The Tetracyclines are known to interfere with the normal intestinal flora if given over long periods leading to superinfection and/or gastro-intestinal disorders like diarrhoea, nausea and vomiting, they damage bone marrow leading to bone disorders and colour the teeth if given to infants;

(*c*) Streptomycin may damage the eighth cranial nerve resulting in impairment of hearing and sense of balance whereas the same mechanism by which Chloramphenical works on the bacterial cell is also manifest in the human patient and that any patient on Chloramphenicol therapy will show changes in bone marrow, damage to the liver and decrease in protein metabolism in the long term.

(*d*) In general, if there is an impairment of liver or kidney function, certain antibiotics would become accumulated in the body and lead to toxic concentrations;

(e) If used in less than therapeutic dosage, any antibiotic could lead to the production of resistant bacteria strains and mutants especially so with the bacteriostatic antibiotics. This does not only result in the patient's infection becoming refractory to treatment but also the entire community is at some risk especially in hospitals where an organism repeatedly exposed to different antibiotics "learn to live" with the antibiotics and such an infection transmitted from patient to patient becomes difficult to clear.

From the foregoing, it becomes clear that the indiscriminate use of antibiotics can lead to problems not only to the patient but also to the community at large.

If someone who is not hypersensitive to penicillin starts using penicillin ointment in treating a sore on his body, he may gradually become hypersensitized to penicillin and if at a later stage he gets an infection and a doctor prescribes for him a course of penicillin injection, the first dose may lead to allergic reactions which may be fatal. The same goes for some people, especially in our villages who would sometimes pour the contents of a vial of benzylpenicillin injection into a calabashful of palm-wine and drink the resulting mixture with the hope of treating himself of gonorrhoea, or takes only a single sub-dose of penicillin injection in an attempt to obtain a cure from his gonococal infection. In the latter case, in fact, the gonococcus becomes resistant to the drug and the patient, especially if a woman, becomes a carrier and creates social problems for the community since those who contract the disease from her can no longer be treated with penicillin. The mis-use of antibiotics is, undoubtedly, dangerous and can even be fatal and to my mind, the main causes of mis-use of antibiotics must be blamed not only on the members of the public (or patients) but more so on the clinician and pharmacist. This is so because a doctor can add to this problem if:

(1) he prescribes an antibiotic for diseases caused by organisms outside the range of activity of the particular antibiotic, e.g. viral diseases like measles, chicken pox and the common

cold are little affected by any antibiotic;

(2) he prescribes the right kind of antibiotic but in improper dosage it can result in failure —excessive dosage could lead to severe and fatal side effects, e.g. over-dosage with Tetracycline can cause toxic hepatitis, Streptomycin in doses of 3G to 4G daily for long periods can damage hearing;

(3) he prescribes an antibiotic in normal dosage without taking into account the total kidney and liver function of a particular patient, e.g. normal doses of Cephalexin in a patient with severely impaired renal function can lead to accumulation of the drug in the body. Chloramphenicol may be fatal to a new born baby whose liver is not fully functional;

(4) he prescribes the antibiotic for a duration shorter than it is required, e.g. Streptococal sore throat needs up to 10 days treatment with penicillin instead of the usual 5 days' treatment which is normally required of penicillin therapy to deal with common infections;

(5) he does not properly select the antibiotic he uses for a particular infection, e.g, using Penicillin in an infection caused by penicillinase-producing Staphlococcus aureus, E. coli, B. subtilis and Klebsiella spp.

Patients or members of the public are to blame for indiscriminate use of antibiotics in as much as they refuse to consult their doctors before self-medicating themselves with antibiotics—

(1) Patients indiscriminately using topical antibiotics—principally penicillin and neomycin for unwarranted cases and then becoming hypersensitized with possible fatal consequences in a later systemic use of the antibiotic concerned.

(2) Failure to follow instructions as to dosage needed to be taken daily, and stopping administration of the antibiotic before the total treatment period is over merely because he sees an improvement in his condition and then decides the doctor was stupid to have given him so much of the drug and he would therefore, stop taking it and keep the rest for future use if he or a friend should ever have a "similar" ailment. This leads to recurrence of the infection and development of resistant strains. Again these left-over drugs may even have expired and their use becomes dangerous.

(3) The problem of using antibiotics, especially capsules of tetracycline for every conceivable form of ailment and especially so in this parts of the country where capsules of Oxytetracycline and Chloramphenicol, variously called "topae", "abobelt", etc. are very frequently used by the public for conditions not requiring antibiotic therapy.

It is my view that the greatest responsibility in protecting the public against the mis-use of antibiotics lies with the pharmacist who as expert on drugs, sometimes permits both doctors and patients to indulge in the wrong use of antibiotics:

(1) A patient with a prescription for 10 days supply of a particular antibiotic tells the pharmacist he can't afford the total cost involved and would therefore, buy enough for 3 days' therapy without any guarantee that the patient would find the extra money to complete the whole course of treatment prescribed and the pharmacist dispenses a portion of the prescription without warning the patient of the possible dangers if the treatment is not completed.

(2) The pharmacist failing to call the attention of the clinician to the fact that some other drug prescribed for the patient together with a particular antibiotic would result in drug interaction. For instance, the pharmacist must call the attention of a doctor who prescribes Chloramphenicol and Phenytoin together to the fact the Chlormphenicol can raise the serum levels of phenytoin administered at the same time by inhibiting those enzymes within the liver which metabolise the anticonvulsant thus raising the serum levels of phenytoin into the danger area.

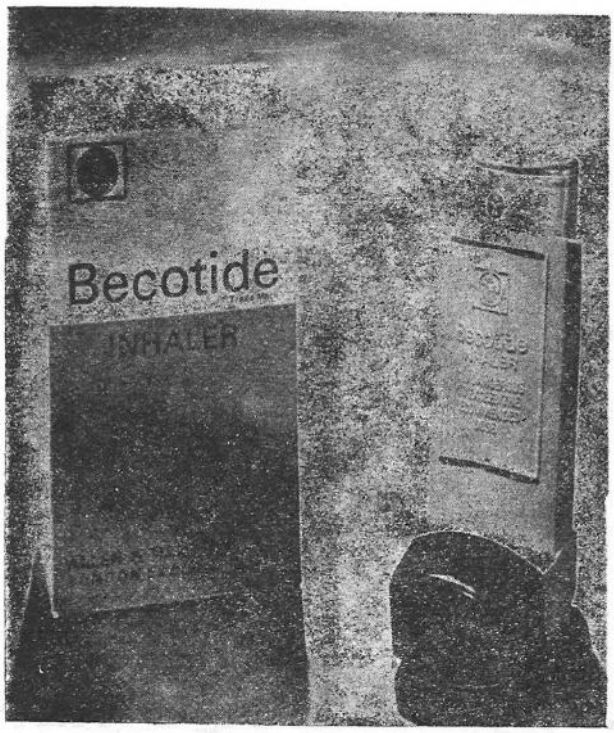
It has been reported that the concomittant administration of Cephaloridine and diuretics lead to increase in the incidence of renal failure and therefore, one should caution against the joint use of these two drugs. Ferrous Sulphate and Aluminium hydroxide and similar antacids are also known to interfere with the absorption of oral tetracycline and similarly it is the duty of the pharmacist to spot such wrong prescriptions and advise the prescriber accordingly.

(3) Most often, the antibiotics that are found being sold freely on the market emanated from the pharmacist who has a statutory duty to keep the supply of such drugs under control.

Mr. Chairman, ladies and gentlemen, I have attempted to discuss the legitimate use of antibiotics, their adverse effects and the problems associated with the mis-use of this class of drugs and I have endeavoured to show that the culprit is not only the patient but also the clinician and the pharmacist.

It is my considered opinion that if Doctors would prescribe antibiotics with due care and consider all the factors involved, and pharmacists would constantly bring to the attention of the doctors any cases of wrong dosage or possible drug interactions and effectively control the supply of antibiotics as required by law and thus make it more difficult for members of the public to obtain them improperly, and if the members of the public would learn to refrain from the indiscriminate use of antibiotics, we would all have a very good chance of eradicating, or at least reducing to a minimum, the incidence of misuse of antibiotics in this country.

Mr. Chairman, ladies and gentlemen, I would like to conclude by reiterating sincerely how delighted I am for being invited to participate in the Pharmacy Week Celebrations and it is my hope that you have a successful Pharmacy Week and successive years should see further celebrations to help educate every member of the public about the hazards which all medical products can cause if improperly used.



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"It was also found that patients with steroid-dependent asthma could be successfully transferred to the aerosol treatment without a fall in FEV_1 or clinical deterioration."[1]

1. Clark, T. J. H., (1972) Lancet, **1**, 1361.

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Becotide INHALER a logical approach in asthma

A SYMPOSIUM*

Pharmaceutical Advertising: Its Impact On The Public

(i) An Advertising Executive's View-point

By A. O. Quayson, Ghana Advertising and Marketing Limited, Accra.

Advertising is a very complex subject and we can hardly get to grips with the subject within the duration of this symposium. What we shall do is merely touch on the fringes in this exercise. What is Advertising? Many definitions have been offered but perhaps the most apt definition is that Advertising is a means of attracting favourable attention to products and services for sale or for hire. Advertising is also very widely applied to ideas or projects to win support.

As a selling aid, Advertising is designed to create a desire to buy. Its function is to persuade and to stimulate demand. In stimulating demand, advertising becomes a power that keeps the wheels of production turning. High production plus high demand equals prosperity. If demand slackens, production slackens. This means low turnover and therefore low profits, and . . . unemployment. Thus demand is the key to production and Advertising is the key to demand.

A prominent American advertising executive, Derby Brown once said, and I quote: "The business that considers itself immune to the necessity for advertising sooner or later finds itself immune to business."

So much for the attributes of Advertising.

The old adage, "There's nothing new beneath the sun," can well be used in speaking about Advertising. As long as man has had anything to sell, he has used Advertising in one form or another. Although the ancient Egyptians, Greeks and Romans, if allowed a day in our world would undoubtedly be amazed by our advertising techniques and devices, yet upon closer study they were the forefathers of the present highly developed art of advertising.

These ancient people used mostly the spoken word for announcing the sale of their wares. The announcers were known as 'criers' and they usually walked the streets for miles a day howling at the top of their voices, the arrival of merchandise.

Today, advertising is a highly skilled profession.

Industrialists and businessmen are making use of advertising agencies, made up of men skilled in the divers specialities, to plan, create and execute campaigns designed to underscore the popular saying that Advertising is the key to world prosperity; and without it today modern business would be paralysed.

But advertising is not merely concerned with making sure that the product on the shelf moves. Advertising is brought to work from the product inception stage.

Let me illustrate just one aspect of this.

Suppose a manufacturer decides to put on the market a new product — say a blood tonic.

The manufacturer's first preoccupation, naturally, will be to ascertain the market potential of the product, that is whether the people of Ghana have a use for a blood tonic, and whether there is room among the plethora of blood tonics in Ghana for another one.

Let us say there is a market for a blood tonic.

The manufacturer then makes use of his advertising agency, to find a suitable name, a name with connotations to the product and which will easily be assimilated by the public's mentality.

When a final, acceptable name has been arrived at, a label and pack are to be designed. This is quite tricky in the case of the blood tonic in view of the large variety of blood tonics on the market.

The truly professional advertising agency should be able to create a packaging that will find its place among those already sitting on the shelves.

* This symposium was organised by the Greater Accra Regional branch of the Society in Accra on 28th May, 1975.

Advertising is again brought to work at test market stage — for the production of publicity material and the conducting of a Regional campaign.

If the test market should be a success, advertising is again brought to work, planning and executing a national launch.

In the case of blood tonic, Radio, Press, Bill Boards, Cinemas, Television, Point-of-Sale, Merchandising and Give aways will be employed to achieve complete national coverage.

Advertising does not stop there. It has to be continued for the following reasons:

1. To expand the market to new buyers.
2. To announce a modification.
3. To announce a price change.
4. To make a special offer.
5. To obtain stockists.
6. To please stockists.
7. To please the sales force.
8. To maintain sales.
9. To challenge competition and perhaps most important of all
10. To remind.

No matter how famous a product is the absence of a constant reminder will invite extinction.

It is only proper, when talking about advertising to talk about the advertising agency — the group of professional men and women who create and present advertisement.

Agency Head

At the head of it all is the agency head. This can be a managing director, general manager or plain agency manager. This is usually a person whose knowledge and experience in advertising is complete.

Under the agency head comes the inevitable accounts and administrative departments as well as the —

Client Service Department

This is manned by account executives or as they are sometimes referred to, client contacts. They are or ought to be very knowledgeable and their function is to liaise with the advertiser, advise as necessary and see to the implementation of the advertising campaign.

Under the Client Service Department are the Creative, Production and Media Departments.

The Creative Department

This is the hub of an agency. It is usually manned by an art director or a studio manager and supported by copywriters, artists, visualisers, layout designers and typographers.

The function of this department is to create the advertisements from briefs supplied by the account executives. The creative department constantly utilizes outside photographers and photo-engravers for material-in-aid.

The Production Department

Which is in close touch with the Creative department is the liaison between the Agency and outside suppliers such as printers and exhibition and display contractors.

The Media and Research Department

Sometimes called the 'planners' is the 'computer' of the advertising agency. Through constant research, this department usually has a thorough knowledge of the mass media situation... The people in this department should know what newspapers, magazines and other publications there are in the country at any given time and their circulations. They also have to know approximately how many radio and TV sets there are in the country; but above all, it is their duty to know who reads what publication, who listens to radio, who watches television, etc.

This department is charged with the responsibility of ensuring that the Client's advertising appropriation is expended in such a way as to make such an investment as viable as possible.

A famous American publicist and educationist — Glenn Frank — once described the advertising man thus: "The advertising man is a liaison between the products of business and the mind of the nation. He must know both before he can serve either."

Now I shall tackle the second part of my contribution: Pharmaceutical Advertising.

Advertising pharmaceutical products is basically no different from advertising other products.

The basic principle is that advertising should be decent, honest and truthful. The presentation of an advertising material in respect of a pharmaceutical product is however, subject to a very rigorous code of ethics, both within the Pharmaceutical profession and the Advertising profession.

There is an advertising code of ethics governing medicines, treatments and appliances which is internationally acknowledged.

The early pharmaceutical advertisements were blatantly unethical. They were totally devoid of principles, and manufacturers, eager only to get rich quick demanded of their advertising agents to produce advertisements which contained more fiction than fact.

One of the ways used by advertisers to entice the public was to name the medication say. . . "Dr Brown's Blood Tonic." This was a means of assuring the public that a medical practitioner had personally invented this blood tonic.

It was not until the beginning of the present century that laws against such fraudulent claims were made and professional ethics for advertising men were drawn up for the protection of the general public.

Pharmaceutical advertising has come a long way, and it is now internationally observed that pharmaceutical advertisements should not

(a) offer any medicine or treatment for serious diseases, conditions or complaints which need the attention of a registered medical practitioner.

(b) Pharmaceutical ads should not contain any medical statement or reference to clinical or other trials or tests which cannot be substantiated by authoritative evidence.

(c) Pharmaceutical ads should not contain any claim (directly or by implication) to extirpate any ailment, illness, disease or symptom of ill-health.

(d) Pharmaceutical ads should not contain any statements or illustrations likely to induce fear on the part of the reader or viewer that he is suffering, or without treatment may suffer more severely, from an ailment, illness or disease.

(e) Pharmaceutical advertisements should not contain copy which is exaggerated by reason of the

use of words, or phrases or methods of presentation such as the use of the words 'magic,' 'magical, 'miracle, 'miraculous.'

(f) Pharmaceutical ads should not suggest or imply that any products, medicines or treatments offered therein will induce miscarriage.

(g) Pharmaceutical ads should not suggest or imply that any product, medicine or treatment offered therein will promote sexual virility or be effective in treating sexual weakness, or habits associated with sexual excess or indulgence, or any ailment, illness or disease associated with such habits.

From the foregoing, Ladies and Gentlemen, you would see that the evolution of pharmaceutical advertising seems to be complete but I am sure that in another hundred years our great grand-children will consider our methods rather crude and not ethical enough.

In conclusion, I would like to offer a little advice, particularly to the industrial pharmacist and that is: the best advertisement is a meritorious product.

Your marketing, sales and distribution techniques may be the best there is. Your advertisements may be brilliant, but if your product is not good, all your advertising will do is make people buy your product the first time. There would be no repeat purchases.

So brilliant advertising needs to be supported with meritorious products.

(ii) **A Lawyer's view-point:**

Tawia Ocran, LLB., Ph.D.
Capital Investments Board, Accra

I should begin by thanking the Executive of the Greater Accra Branch of the Pharmaceutical Society of Ghana for inviting me to participate in this Symposium. It is a Symposium on an important topic, and I feel highly honoured for the invitation.

I was invited as a member of the public; but I also happen to be a lawyer by profession. So I will speak both as an interested member of the public and as a lawyer.

Mr Chairman, the theme for this evening's Symposium is Pharmaceutical Advertising, and perhaps I can start the ball rolling by discussing the provisions as well as the policy basis of the legislation governing this sphere of activity.

The Pharmacy and Drugs Act of 1961 is the principal legislation regulating the manufacture, storage, transportation and supply of drugs in Ghana. I regard advertising as part of the process of supply of drugs, for the seller must first acquaint the public of his wares before orders can be placed for them, and advertising is perhaps the most instant and most far-reaching form of public information.

It is section 34 of the Pharmacy and Drugs Act that deals specifically with the control of publication of descriptive matter in relation to drugs. Allow me to refresh your memories by going through the provisions of this section.

Section 34 imposes a general prohibition on the publication of descriptive material on certain drugs aimed at persuading people to use those drugs. To this general prohibition on publication there are three exceptions. Publication of descriptive material is allowed

(i) where this is done under the directions of the Minister or Commissioner responsible for Heath;

(ii) where the descriptive material is contained in a document meant for the use of the pharmaceutical and medical professions, and

(iii) where the description is done as part of an application for the grant of patent.

Now, what are these drugs upon which the general prohibition operates? They fall into three categories:

(i) drugs meant for the prevention or treatment of a specified number of diseases, including syphilis, gonorrhoea, blindness, cancer, deafness, diabetes, epilepsy, paralysis, small pox and pneumonia;

(ii) drugs aimed at terminating or influencing the course of human pregnancy; and

(iii) drugs relating to human sexual intercourse.

Section 57 of the Act makes it an offence punishable by a fine or imprisonment or both, for anyone to contravene the prohibition on advertising.

One word in Section 34 which is crucial to the whole section, and which might well become the main bone of contention in any prosecution under the section, is the word "publication."

Now, what constitutes publication? Here, a number of questions suggest themselves for discussion. The Act does not actually define publication, but merely describes various modes of publication. It talks of publication by way of advertisement, or on the container in which the drug is supplied, or publication "in any other manner."

Does this latter phrase mean that communication of information on the drugs to even one person is publication, as is the case in the law of libel? How appropriate would it really be to draw an analogy from the law of libel in this case?

Secondly, what the Act seems to prohibit is not publication of the drugs themselves, but publication of *descriptive matter* on the drugs, i.e., oral or written statements describing the composition or effect of the drugs. This very easily raises the question of sufficiency of the descriptive material. Suppose X, a drug dealer puts in the newspaper an advertisement containing the name of his drug Company and a picture of a bottle with only the word SYPHILIS written on it, can he be said to have published descriptive material within the meaning of the Act?

Again, if we are to rely on the general law of publication, the language used in the publication on the drugs becomes relevant in deciding whether there has been publication or not. In the general law of publication, communication, to amount to publication, must be in a language intelligible to the recipients of the communication. Now suppose our friend, the tricky drug dealer, in his newspaper advertisement, this time adds to the word SYPHILIS pharmaceutical or medical terms intelligible only to those in the medical sciences, can he be said to have published descriptive material within the meaning of the Act?

Mr Chairman, I would now like to shift from the consideration of the language of Section 34 to its policy

basis, i.e., the reason why that section was enacted at all. On this subject I am a complete layman, and I stand to correction on every opinion that I express here.

I have been thinking of the reasons which led the authorities to impose this general prohibition on advertising of the drugs in question, and I have come up with two possible reasons. First, it may be felt that some of the drugs are very dangerous or emanate from quacks, and that the general public should not be introduced to them for they might use them without the benefit of proper medical advice. This reason would cover drugs for such diseases as blindness, cancer, epilepsy pneumonia, etc. Secondly, it may be felt that the popularisation of some of the drugs would lead to greater promiscuity and other forms of immorality. This reason would cover drugs for venereal diseases, sexual intercourse, and abortion. It is obvious that both reasons may apply in the case of one particular drug.

If the reasons I have suggested are valid, then I must say that I personally do not consider them weighty enough to warrant the imposition of such a general prohibition on publication. Take the first reason i.e., the dangerous nature of the drugs or the quackness of their manufacturers. This reason would be weighty only on the presupposition that the public has automatic access to the drugs once they get acquainted with them through advertising. But if, as I believe is the case, one can get these drugs solely on a doctor's prescription, then does it matter that the patient happens to know of the existence of the drugs? Or take the second reason, i.e., the popularisation of certain drugs leading to greater immorality. This style of thinking merely betrays an unjustifiably strong streak of puritanical paternalism, and I challenge the premises upon which this whole morality is founded. If two consenting and sane adults decide to have sex, and they want drugs that will either heighten the pleasure of the sexual act, or prevent venereal diseases or prevent unwanted pregnancy, is it the business of the community to deny them knowledge of the existence of such drugs? If it is children or idiots that we are worried about, surely we can prohibit the sale (the sale, *not* the publication) of these drugs to them.

It is surely the duty of the community through its authorities to help its citizens to avoid the use of dangerous drugs or drugs emanating from quacks. But it is equally the duty of the community to broaden the horizons of enlightenment of its members through mass media education on all matters affecting them, including their health, their sex life and their life-styles in general.

And it is important that these two duties be weighed carefully before we promulgate any legislation prohibiting the exposure of people to knowledge about drugs.

(iii) **A Pharmacist's view-point:**

M. S. Donkor, MPSG., M.I. Pharm. M.

J. L. Morison, Son & Jones (Ghana) Limited, Accra.

Pharmaceutical advertising must be related to the ethics of the profession of pharmacy as laid down in the Society's Code of Ethics and the Pharmacy and Drugs Act, 1961, Act 64; and directives issued by the Pharmacy Board on pharmaceutical advertising.

I believe those who are pharmacists need not be reminded of these requirements because you are all expected to be conversant with them. All the same, I quote below Section 34 of the Act which states inter alia the law relating to the publication of descriptive matter on drugs:

"(1) Subject to the provisions of this section, no person shall by way of advertisement publish in relation to any drug descriptive matter calculated to lead to the use of that drug —

(a) for the prevention or treatment of any disease specified in the Fifth Schedule to this Act; or

(b) for the purpose of terminating or influencing the course of human pregnancy; or

(c) for any purpose relating to human sexual intercourse.

(2) Subject to the provisions of this section, the Pharmacy Board may, with the approval of the Minister serve on any person a notice prohibiting him from publishing in relation to any drug descriptive matter referred to in the notice.

(3) This section does not apply to the publication of descriptive matter —

(a) by direction of the Minister or

(b) in a document intended for persons whose profession or employment calls for knowledge either of drugs generally or of drugs of the description to which the matter in question relates or

(c) for the purposes of an application for the grant of a patent."

Within the context of this law, we are restricted in the type of advertisements we as pharmacists, should put up to the public either through conventional advertisements, i.e., the use of the media — Press, Radio, Television, and Cinema — as well as non-conventional advertisements, i.e., sales vans and mobile speakers.

As pharmacists, we should always be aware of the dangers the incessant advertising of those drugs which even the law permits, could pose to the public. Incessant advertisements on blood tonics and pain killers may lead to the public making a habit of taking these drugs even when not required leading to the eventual misuse or abuse of these drugs. Caution therefore, needs to be exercised in advertising pharmaceuticals of any kind to the lay public. This is in fact what led to the issue of new directives from the Pharmacy Board: "It is observed with regret that the text of most advertisements which appear in our local papers, on radio and television are very obnoxious. Under the Pharmacy and Drugs Act this is a serious irregularity which must be rigidly controlled. Action in this regard has exercised the concern of the Pharmacy Board for quite a time. It is decided that the attention of all concerned should be drawn to the threat which this irregularity poses to the health of the general public and that they should all be requested to co-operate in the campaign to stem this anomaly.

In this connection it is required that with immediate effect, all pharmaceutical wholesalers, drug firms and advertisers of drugs should obtain approval from the Pharmacy

Board before they publish any advertisements on drugs.

All advertising agents are also requested to ensure that where drugs are concerned, the text of advertisements are cleared with the Pharmacy Board before the advertisements are published.

It must be noted that henceforth, firm statutory action will be taken against defaulters".

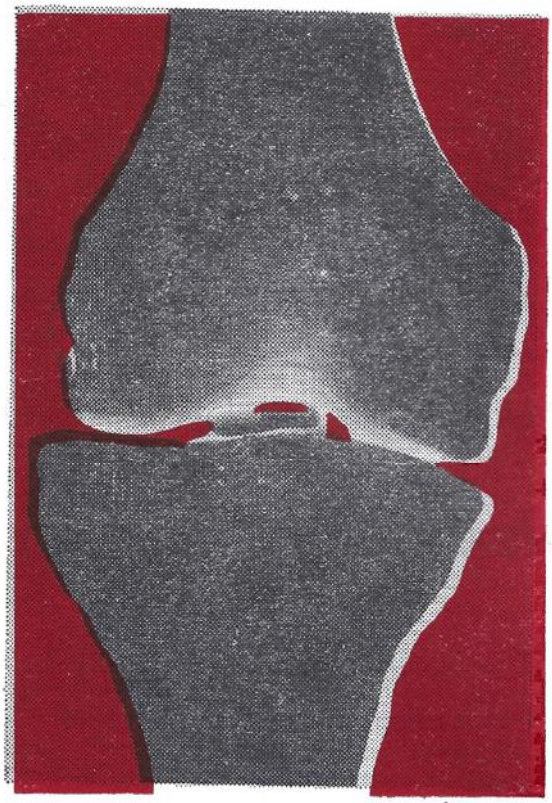
The Board therefore, has a right to reject or accept the text of an advertisement directed to the lay public without prejudice to the drug itself being available to the public.

Pharmaceutical advertisements should be discreet, technical and ideally restricted to people in the pharmacy, medical and allied professions through professional journals and at medical and pharmaceutical exhibitions.

I believe pharmaceutical advertisements should not be directed to the lay public who will become hypochondriacs and thus aggravate drug abuse and/or misuse.

I trust henceforth as pharmacists we will see it as our duty to protect the public by upholding the ethics of the profession and stopping unscrupulous and farce advertisements on drugs.

'Orudis' in arthritis



Optimal efficacy and tolerance now further confirmed by two new studies

Activity equal to that of phenylbutazone

"...in 47 patients with osteoarthrosis of the hip, it has been shown that there is little to choose in efficacy between ketoprofen ['Orudis'] 200mg daily and phenylbutazone 300mg daily... Side-effects were mild..."[1]

Comparative clinical studies with indomethacin[3] and ibuprofen[4] have already shown that 'Orudis' affords both significant therapeutic effect and low toxicity in the treatment of arthritis.

1 *Rheumatol. and Rehabil*, 13, 125, 1974
2 *Scand. J. Rheumatol.*, (in press), 1974

Tolerance markedly superior to that of aspirin

"...a trial with gastroscopic examinations has allowed the adoption of the hypothesis that the new anti-inflammatory product ketoprofen ['Orudis'] is better tolerated by the gastric mucosa than acetylsalicylic acid."[2]

The latest comparisons with two further widely prescribed agents provide additional cogent evidence of its ability to meet the criteria for optimal drug management.

3 *Br. Med. J.*, iv, 398, 1972 4 *Br. Med. J.* iv, 82, 1973
Full information available on request

Orudis

'Orudis' is a trade mark of May & Baker Ltd Dagenham Essex RM10 7XS England for its preparations of ketoprofen
May & Baker Ltd P.O. Box 159 Tema

M&B May & Baker

A member of the Rhône-Poulenc Group of Companies

MA2381

INTRODUCTION TO MANAGEMENT

By J. E. Akyirem, B. Pharm., M.P.S.G., M.I. Pharm. M., Dip. B.M., G.N.T.C. Clinic, Accra.

Pharmacy has provided services to people since its inception. As such it has grown to be a form of business whether it has a profit motive or not. All branches of pharmacy, namely industry, hospital, wholesaling and retailing consist of business activities. For efficient running of these operations management techniques are essential. Today, the Pharmacist sees himself in an environment full of business activities. Today the Pharmacist has realized the challenges he faces as a result of business operations in which his profession is involved.

Business has evolved as a dynamic phenomenon, which is constantly changing in relation to economic trends. The problem of raw materials which the pharmaceutical industry faces continues to increase the Pharmacist's responsibilities in industry. Scarcity and Choice also present economic problems to the Pharmaceutical Business Executive. Recent economic crises such as the Energy and Sugar crises have affected the pharmaceutical industry to a large extent. The sugar crisis in particular has caused a dramatic price increase of all pharmaceutical products containing sugar in the form of simple syrup. These effects have forced the industrial Pharmacist to adopt optimum price mechanism for his products. Owing to the unpredictable nature of the world economy there is the need for the Pharmacist to equip himself with sufficient knowledge in Business Management to meet the challenges he faces. He realizes that he can only continue to be in active business through adequate planning and forecasting.

In a series of articles to be produced under the Business and Economics Section of the Ghana Pharmaceutical Journal, attempt will be made to spotlight various aspects of Business Management. This will range from Principles of Management, Economics, Personnel Management covering employee motivation, delegation of authority, decision-making, promotions and salaries. Marketing which is essentially the flow of goods and services from producer to consumer will also be treated. Other areas which will be discussed include Accounting and Business Finance, laying emphasis on the study of procedures and policies involved in short-term and long-term business financing. Particular attention will be focussed on interpretation of financial statements such as the balance sheet. Mention will also be made of commercial law and industrial relations, an equally important field in business operations.

To the Pharmacist or any Business Executive the concept of management is not new. It is the application of modern management techniques which is of paramount importance to a person managing business. This can be achieved through a continuous co-ordinated processes called planning, organizing, directing and controlling.

The Management Process

"A manager", according to Newman and Summer, "is a man who gets things done by working with people and resources; in order to reach an objective, he co-ordinates the activities of others rather than himself." This definition of the manager pre-supposes the existence of an organization in which human beings and inanimate objects are the input factors. It also anticipates the art of managing as a social process: It is a PROCESS because it comprises a series of actions that lead to the accomplishment of objectives. It is a SOCIAL PROCESS because these actions are principally concerned with relations with people.

The manager today is a man who is entrusted with making the most efficient use of men, machines and money. He cannot be successful unless he uses his men in such a way as to effectively compete, make the men satisfied to work in his organization under his direction and satisfy them as citizens and consumers. Competition keeps the manager on his toes. Competition in prices and services makes the efficient use of men essential. Competition for his labour force makes the manager operate so as to make the workers want to stay with him.

The existence of an organization in a highly competitive and changing environment, where internal and external pressures impinge upon the functioning of the organization, presents certain problems to the manager. He will not quite be able to fulfil his mission of organizing resources and co-ordinating activities of personnel within the enterprise, and of taking account of the changes emanating from the outside world, simply by adapting to his surrounding situation. If he were in full control of both the internal and external forces, adaptation would perhaps serve adequately. As regards internal pressures the manager is not complete master of his activities. For example, the individual personal motivations of human beings in an organisation may militate against the objectives or goals of the organization; or their

informal group objectives may be antithetical to the enterprise objectives. As for the external pressures, they emanate from a large universe of which the organization is insignificant in size and over which the manager has no automatic, effective control. For the manager to succeed in his mission, therefore, he must go beyond adapting; he must be a dynamic, innovating force and be able to exercise a positive influence to make things happen. That is to say the manager must plan, organize, direct and control activities in order to attain his mission — the achievement of organizational objectives and goals. All these actions are inter-related, and in a successful managerial process they are also bound to be inter-dependent. The efforts of any manager who, for one reason or other, disregards these inter-relationships and inter-dependencies would result in failure. No enterprise can thrive and grow without this condition.

It is this overall consideration which makes Henri Fayol's saying so fundamental to the theory of planning and control. He says: "To manage is to forecast and plan, to organize, to command, to co-ordinate and to control. To foresee and provide means examining the future and drawing up the plan of action."

Management may thus be simply defined as the co-ordination of all the resources of an organization through the process of planning, organizing, directing and controlling in order to attain stated goals. Management has a greater responsibility than that assumed by many labour leaders. It must satisfy the workers and the public. Some labour leaders see their own responsibility as securing higher wages and greater benefits for the workers regardless of the cost to the public.

Planning

Planning is defined as the thoughts and decisions which result in precisely what course of action a business concern or organization will take to achieve its goals. Plans can be short- or long-range. If plans are to be successful everyone in the organization must perform his task well. Everyone is important if goals are to be reached.

Generally speaking, the PLAN embraces the entire management function which includes forecasting, organizing, leading and controlling. Manifestly, then, planning covers a wide range of activities that are generated internally in the organization, as well as those that are generated externally.

By and large, a business plan is derived from economic and general business forecasts. Formal planning for a business firm, is the process of gaining understanding of the past and present situation of the particular firm, of estimating the probable future situation, and of choosing objectives and course of action consistent with these situations. The resultant plan from various forecasts (annual, long term, short term, special etc.) gives a picture of the future with less certainty. It gives the known facts, and those foreseen for a certain time.

Thus in the course of forecasting there should be established criteria for analysis and a ranking of the objectives and goals toward which the conduct of the organization's operations is to be directed. This important decision process gives direction in the search for opportunity and the means for finding the implications of alternatives, as well as the value system for choosing among alternative courses of action.

Organizing

Organizing is the second function of management. The size and nature of an organization depends upon its plans. If an organization is well planned, its chances of success are very good. To carry out plans after they have been prepared, it is necessary to create an organization. It is a function or responsibility of management to determine the type of organization needed to carry out stated plans. The objectives have a direct influence upon the nature and structure of the organization. A company whose objective is to provide food and shelter to the public requires an organization entirely different from that of a firm whose product is electric bulb. Similarly a pharmaceutical company has an organization which differs from that of a hospital pharmacy.

Most companies have organization charts. These illustrate how the various functions fit together. They also show the chain of command or who is responsible for each function. In a well-run organization, it is very important to have levels of leaders. These leaders are responsible for communicating plans or goals to their employees. They are also responsible for informing their superiors about employee performance.

Organization will be discussed in detail in the next article on management functions. This will explain organization theory, structure and relationships.

Directing

Directing an organization means to aid or direct its member in order to reach stated objectives. It is only upon reaching stated objectives that everyone benefits. The size of the organization determines the amount of time that is spent in actual directing.

Directing, the third function of management, is a phenomenon of dynamic man — to man relationship between a manager and his subordinates. It is a process by which a manager directly and personally influences the behaviour of those who work with him, and by which his subordinates in turn feed back information — ranging from highly objective, personal responses to data on operating conditions that is vital to the manager in his subsequent actions.

The human elements who play a very vital and crucial part in the success of a business plan, must themselves be anticipated, be planned for. Generally human beings in an organization have their own grand strategy in seeking the opportunity to use their abilities to realize their needs and goals (not necessarily the organization's). And so they follow objectives and goals which are not identical with, and may conflict with the organization's objectives or goals.

In order to reduce conflicts arising from this situation, the manager must plan to fulfil a number of employee expectations. These include: (a) educational development and reward-punishment motivations, also involving mutual co-operation, positive control mechanisms against human behaviour, and (b) a flexible organizational structure to meet the objective needs of the firm and the acceptable needs of individuals in the organization.

The plan will not succeed, however, unless there is a system of communication which affects and encourages feedback to the manager to enable him to re-adjust the organization to unexpected situations. Thus, the planner or manager

has to lift his conception of the communication system beyond the limited person-to-person level, to the whole organization. This leads to the generally accepted concept that an organization, like a society can only be understood through a study of the messages and the communication facilities which belong to it. In other words, it is communication, or the ability to transmit messages and to react to them, that makes the organization efficient, provided that the reaction is not unduly delayed.

If the communication system is not efficient, control information to the person or department whose work is being measured and controlled cannot be obtained. Should this happen, the person or department becomes incapable of adopting timely corrective action. The motivation, direction and guidance of personnel to pursue courses of action which at least satisfy company objectives will not yield good results, if the communication system is ineffective. Plans are prepared by executives but their execution depends on subordinates who in turn depend on efficient communication.

This leads to the proposition that, to fulfil the plans of the firm there must also exist a plan covering the selection, training, motivation of the human elements in the firm. The success of this depends upon proper direction from the manager. He has specific goals to attain and therefore directs his personnel towards these goals. These goals define his authority and limit it. Direction for the business manager is not arbitrary but is determined.

Controlling

Controlling forms the fourth function of the management process. It tells the manager if the organization has been directed properly and if it will meet the company's objectives. Controlling measures actual, or present performance against what was expected. It gives the manager a chance to make corrections before it is too late. Good controls also allow for improvement.

Planning will be meaningless unless the stated goals in the plan and the activities appertaining to it can be measured and controlled. Conversely controlling will amount to nothing unless there is a plan of objectives with the required, specified activities. This justifies the concept that planning and controlling are complementary and that they must not exist in isolation.

If a plan were never in need of revision and were executed flawlessly by a perfectly balanced organization under the direction of a great leader, there would be no need for control. However, organizations do not always work smoothly and, therefore, need revisions and control to meet changing conditions.

Control takes many forms. Production schedules indicate if sales orders can be filled. Quality control ensures management that the product is being produced correctly. Accounting is a form of financial control and budgets show where money is being saved or lost.

The effectiveness of leadership is often open to question. It is the purpose of the control function to make the corrective action necessary to assure the fulfilment of organizational objectives. Although control means corrective action that should be objective in all respects, the reactions of those subjected to controls may be highly emotional and include resentment.

The reason for this reaction is that control always involves the people who make up the organizations. They are the ones charged with responsibilities and are accountable to their superiors for the performance of these duties. When determining whether or not goals are met, it is the performance of the people of the organizations that is actually being reviewed. One way of developing an understanding of the nature of control is to place the control function in perspective within the framework of systems concept.

Control involves the corrective action that is needed within the organization in order to keep it on its course. That course is always the fulfilment of corporate goals. There are three steps in the control process. These are:

1. Establishment of standards of performance,
2. measurement of current performance in relation to those standards,
3. the need for corrective action.

There are methods of control which have been found more effective than others in business operations. It must be emphasized that control is a tool of management. Like any tool, it is only as effective as the person using it. In business, this person is the professional manager—the decision maker.

Control in all its forms has to be flexible to take account of requirements or standards and changes in requirements, so as to adjust to the feasible achievement level. Competition, government, society all form various kinds of pressures within the organization. Thus controls can be a reaction to internal and external problems.

The question of integrating controls with plans and other aspects of managing an organization becomes very crucial. For example, if controls are to be effective, then objectives, delegation of responsibility, lines of authority and command and training of personnel, etc. should be clear and proper; communication lines with appropriate feedback must also be efficient. In other words, a system of standards, measurements, and reports by themselves will not produce control unless a communication network with feedback is designed to support it. This is the only way a sound hierarchy of objectives, coupled with a control structure that measures the performance of each unit against its goals, provides an integrated mechanism for channeling the diverse activities of a firm towards a common set of objectives. But this can only be achieved if the controls, as already mentioned, are flexible enough to adjust to changes in objectives too.

The four functions of the management process — planning, organizing, directing and controlling will be discussed in detail in subsequent articles. The dynamic state of the economy of the world forces the business executive to integrate these tools of management in the operation of his organization. Since the Pharmacist finds himself in an environment full of brisk business activities, he also requires these tools of management in his business operations. How is he going to plan for expansion when economic problems like inflation and scarcity continue to militate against his business? He must co-ordinate the four functions of the management process properly if he is to succeed in his business. Management itself is not new. Modern scientific management techniques have been discovered. The pharmaceutical manager, like any other business executive requires these techniques for effective utilisation of the resources at his disposal.

SOME ASPECTS OF CLINICAL PHARMACY

By N. I. Y. Fiagbe, B. Pharm., PhD., M.P.S.G., Department of Pharmaceutical Chemistry, Faculty of Pharmacy, University of Science and Technology, Kumasi.

ABSTRACT

There have been many views about other fields of Pharmacy which can be undertaken in Ghana. Recent symposia, surveys etc. indicate that people will even opt for Industrial Pharmacy, Hospital Pharmacy and even Clinical Pharmacy.

In this article an attempt has been made to detail some aspects of clinical pharmacy—practice of pharmacy clinically where the "patient awareness" in the pharmacist is stressed—and the pharmacist's responsibilities to other members of the health team.

Pharmacy, like all other professions is a living profession, requires change to meet the present and the future needs of the public as well as give satisfaction to the pharmacist and he in turn to be an encyclopaedia to both the medical practitioner and the medical profession.

There are at present other aspects of pharmacy which have not yet been fully pursued in this country due to the fact that Ghana is developing and the pharmacy profession is also just being developed, Manufacturing on the large scale, Industrial Pharmacy, Hospital Pharmacy, Retail Pharmacy and Medical Representation aspect of the profession are being of interest to the pharmacist being trained in University of Science and Technology.

Of late it has been thought that a field of interest to all (patients, medical practitioners, pharmacists in all fields) will be **Clinical Pharmacy.**

CLINICAL PHARMACY

Clinical pharmacy implies the practice of pharmacy in the presence of patients, whether they are hospitalised or ambulatory out-patients visiting their community pharmacy or neighbourhood health centre. The term does not imply that this practice be confined to the institutional setting. However, the institution is the ideal training ground for the Clinical practice of pharmacy because it provides the opportunity to:

1. Study and observe a multitude of disease states and drug therapy regimens.
2. Observe on a day-to-day basis patient responses to drug therapy.
3. Gain access to the patient's medical record.
4. Communicate directly with patients, physicians, nurses and other health professionals.
5. Monitor patients on a myriad of drug regimens and detect, observe or minimise drug-drug interactions, drug-food interactions, drug-laboratory test interactions, adverse drug reactions, intravenous admixture incompatibilities and iatrogenic disease.

Information obtained in the institutional setting can be applied to any area of pharmacy practice for example in the manufacturing laboratories, in hospital practice, in medical representation aspect of pharmacy practice, etc.

The most important educational aspect of clinical exposure to patient is the added relevance that it gives to the didactic portion of the pharmacy curriculum. The patient from whom the pharmacist must develop a deep concern becomes the point-of-application of acquired knowledge.

THE BASIC COMPONENTS OF CLINICAL PHARMACY

1. Communication

In many instances the potential for service to patients and other health

professionals by the pharmacist is not realised simply because of lack of communication. Pharmacists, in communicating with patients, physicians and other members of the health team, have not always been successful in the past. For the pharmacist to become effective clinical practitioner, he must develop his communicative skills.

As a prerequisite for effective communication with Physicians and other health professionals the pharmacist must become familiar with their various functions as well as with medical technology. The Pharmacist must possess and convey a confidence in his abilities, a willingness to listen, a concern for contributing to patient care. He must never be condescending in his actions or attitudes. Once mutual respect and an appreciation of the roles and responsibilities within the health team are acquired, the pathways of communication are open.

ii. Counseling

Counseling used in the context of pharmacy practice might be defined as the provision of advice on therapeutic matters to patients or members of the health care team. Both institutional and community settings of pharmacy provide an opportunity for the pharmacist to advise patients regarding their prescriptions. Discharged impatients, clinic outpatients and patients who acquire their prescription needs at the community pharmacy should all be counseled regarding the proper home use of their medication.

Verbal instructions should be concise and exact. The pharmacist should attempt to evaluate the patient's mental ability to comprehend and adjust the conversation accordingly.

iii. Consulting

One of the most promising and potentially significant aspects of the clinical practice of pharmacy is consulting. The demand for a source person for detailed drug information will increase as the "information explosion" continues, medical care becomes more complex, health manpower shortages become more acute and potential hazards of drug therapy become more evident. That person logically, is the pharmacist. By cultivating his basic undergraduate education and seeking avenues for applying his knowledge, the pharmacist can expand his role to function as a therapeutic consultant to the public, to the physician and other health professionals.

CONCLUSION

The main objectives in clinical pharmacy therefore are:

(*a*) To acquaint the student with clinical application of pharmacological and pharmaceutical principles.

(*b*) To help make the student more aware of the general methods of diagnosis and patient care specifically as they relate to drug therapy.

(*c*) To develop in the student a facility for effective interaction with the patient and with practitioners of other health professions.

(*d*) To help the student develop a patient awareness in providing pharmaceutical services.

(e) To enable the student to integrate the knowledge acquired in the preclinical years and apply it to the solution of real problems, and

(*f*) To develop in the student an awareness of his responsibility in monitoring drug utilisation.

The 33rd Ghana Pharmaceutical Conference and Exhibition, August 28 - 30, 1975

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Hon. General Secretary

33RD GHANA PHARMACEUTICAL CONFERENCE AND EXHIBITION, 1975

PROGRAMME–SOCIAL ACTIVITIES

THURSDAY, 28TH AUGUST

7.00 p.m. Cocktails at the Forecourt, State House,
Supported by Danafco Ltd.

FRIDAY, 29TH AUGUST

12.30 p.m. Lunch at the Banquet Hall, State House,
By courtesy of the Pharmaceutical Society of Ghana.

7.00 p.m. Cocktails at the National Headquarters, 268 North Kaneshie Estate.
By courtesy of the Accra Branch of the Pharmaceutical Society of Ghana.

SATURDAY, 30TH AUGUST

12.30 p.m. Lunch at the Banquet Hall, State House,
By courtesy of Ciba-Geigy.

8.00 p.m. Dinner and Dance at the Banquet Hall, State House.
Supported by Industrial Chemical and Pharmaceutical Co. Ltd. (I.C.A.P.).

ACKNOWLEDGMENTS

The President and National Council of the Pharmaceutical Society of Ghana sincerely thank the Director and Staff of the State Protocol Office for kindly making available the facilities at the State House for the 33rd Ghana Pharmaceutical Conference and Exhibition.

The success of the organisation of the Conference and Exhibition has also been greatly facilitated by the kind assistance received from various Pharmaceutical Companies who by their usual kind co-operation and support contributed not only by participating in the Exhibition or taking advertising space in the Conference issue of the Ghana Pharmaceutical Journal but also made donations either in kind or in cash towards the cost of the Conference.

We wish to mention in particular the following companies who made financial contributions:

Atlantic Chemists
Bendu Ltd.
Cee Cee Cee & Co.
Danafco Ltd.
Domey Trading Co.
Ghana Co-op. Pharmaceutical Society Ltd.
Gihoc Pharmaceutical Division
Glaxo-Allenburys (Ghana) Ltd.
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Sandoz Ltd.
A. J. Seward (Ghana) Ltd.
Standard Drug Co. Ltd.
Susana Christian & Co.
Tenesa Pharmacy
Vetrico Ltd.

To all other individuals and organisations who helped in making this Conference a reality, we say thank you very much.

SOCIETY NEWS

1. 1974 Retention Fee Arrears:

The 15th February, 1975 issue of the Gazette published the current list for the year 1975 of all members of the Pharmaceutical Society of Ghana—whether they had paid the previous year's Retention Fee or not.

After several attempts which did not avail the Society, the National Council has been compelled to ask the Pharmacy Board to invoke Section 9 of Act 64 against defaulters of 1974 Retention Fee payments and to terminate their membership.

2. National Headquarters Building Fund:

You will all recall that the 32nd Conference held in August 1973 resolved that all members should within 2 years from that date pay up their contribution of C100.00.

The response has been very poor despite our constant reminder notices in this Journal and elsewhere.

The National Council wishes to make it clear that stock will be taken at our forthcoming 33rd Conference and a firm decision taken on what to do to defaulters.

3. Congratulations to our new Military Pharmacists:

It is gratifying to mention that at the July 1975 passing out parade of newly commissioned professional men and women at Military Academy, Teshie, the first two prizes were won by Lt. Joseph Kwasi Yeboah and Lt. Joseph Appiah respectively.

We are, as a Society, honoured by their excellent performance, and we salute them.

We wish all our members in the Armed Forces well and we pray that they will remain always dedicated and hardworking to be judged "fine soldiers".

4. Obituary:

We regret to announce the death of the following members:-

A. O. Ampah (Registration No. 52)

I. Quartey-Papafio (Registration No. 262)

S. E. D. Quaye-Foli (Registration No. 265)

May they rest in peace.

by Hon. General Secretary

5. PHARMACISTS' CAR IDENTIFICATION PLATES

Messrs Hoechst Consulting GmbH, Accra, have presented 1,000 Car Identification Plates with the Society's emblem for use of Members. Messrs Hoechst who presented the plates to the Society free of charge have kindly agreed with the National Council that the plates be sold to members to raise funds to support the Society's activities. The Plates are available from the National Secretariat and all Regional Secretariats at C10.00 each. Our sincere thanks to HOECHST for their magnificent donation.

INDEX TO ADVERTISERS

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