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The Ghana Pharmaceutical Journal

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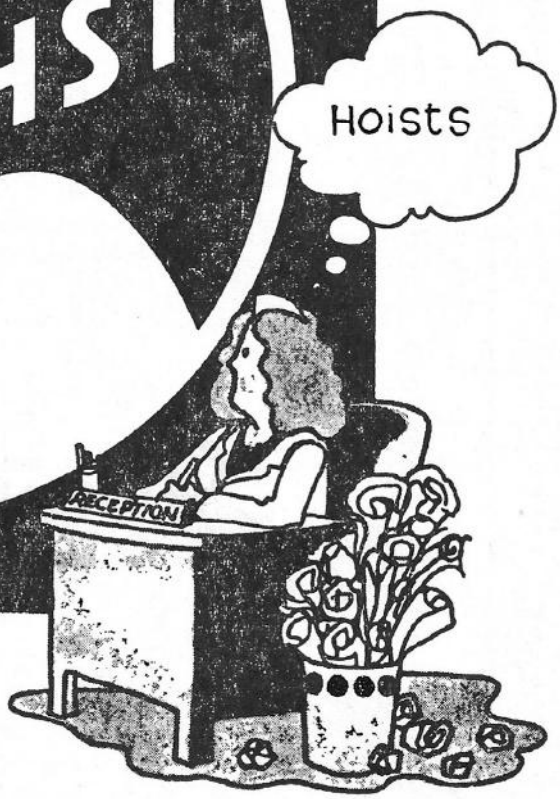

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EFFECT OF CHLOROQUINE ON THE PROSTAGLADIN CONTENT OF GUINEA PIG LUNG

By R. Ansa-Asamoah, M.Pharm., MPSG., Department of Pharmacology, Faculty of Pharmacy, University of Science and Technology, Kumasi, Ghana,

Summary

The total prostagladins extracted from the lungs of chloroquine treated guinea pigs has been assayed on the isolated rabbit duodenum preparation. The total prostagladin was estimated as $PGF_{2\alpha}$ activity. The prostaglandin content of lungs obtained from untreated guinea pigs was found to be 42.8 ± 3.4 ug/gm wet tissue (n=16). The prostaglandin content of lungs obtained from chloroquine treated (10mg/kg) guinea pigs was significantly lower than that obtained from the controls. Prostaglandins from lungs of guinea pigs pretreated with 30mg/kg chloroquine caused relaxation of the rabbit duodenum 24 hours after treatment.

Introduction

Prostaglandins are a group of closely related unsaturated hydroxy fatty acids (Fig. 1) which show a wide range of pharmacological activity. They were first discovered in human seminal plasma and sheep vesicular glands by Von Euler in 1935 and have since been isolated from a number of mammalian tissues and fluids including lung, kidney, liver, brain, spinal cord, adrenal gland, ovaries, iris, stomach, intestine and menstrual fluid (Table 1).

Even though the physiological role of these substances is not known, the association of subnormal seminal prostaglandin levels with infertility in man lends support to the view that they may play a role in aiding conception. The discovery of $PGF_{2\alpha}$ and PGE_2 in menstrual fluid and human endometrium and of the potent oxytocic effect of intrauterine $PGF_{2\alpha}$ in women suggests that the prostaglandins may be involved in menstruation and that high levels may account for the symptoms of primary dysmenorrhoea.

Since a number of anti-inflammatory drugs characterised as "anti-defensive" compounds block the production of PGE_2 and $PGF_{2\alpha}$ it has been suggested that a function of the prostaglandins is to mediate defensive reactions to noxious influences. This has been suggested for certain actions of prostaglandins such as bronchoconstriction and skin inflammation. If prostaglandins are involved in defensive reactions such as inflammation and bronchoconstriction, then it is possible that abnormal high levels after chloroquine administration may precipitate pruritus. The present study was undertaken to investigate whether the prostaglandin content of the guinea pig lung is modified after chloroquine administration.

Materials and Methods

Extraction of Prostaglandins from the guinea pig lung.

Many methods are available for the extraction of prostaglandins from animal tissues. Samuelson (1963), Lee (1967), Ambache, Reynolds and Whitings (1963). Essentially, the methods involve homogenizing the tissue and extracting and partitioning of the extract using various organic solvents to separate hydroxy fatty acids from other biologically active substances. The method employed in this investigation is a modification of that of Ambache *et al* (1963). The guinea pig lung was chosen because it is known to contain predominantly $PGF_{2\alpha}$ and PGE_2 and metabolities of PGE_2.

The guinea pigs were killed, their lungs removed and washed thoroughly with normal saline. The lungs were weighed and homogenised with an Ultra-Turrax homogeniser (model TP. 18/2N) in a 50 ml test tube containing distilled water at PH 7.7-8.2 (1ml per 200mg tissue).

The cell debris from the homogenate was removed by repeated centrifugation at 8,000 RPM for 20 minutes at 27-30°C. The aqueous extract was partitioned with 1 volume of ether and the ethereal phase of low prostaglandin activity was discarded. The aqueous phase was further partitioned with 1:1.1 volume

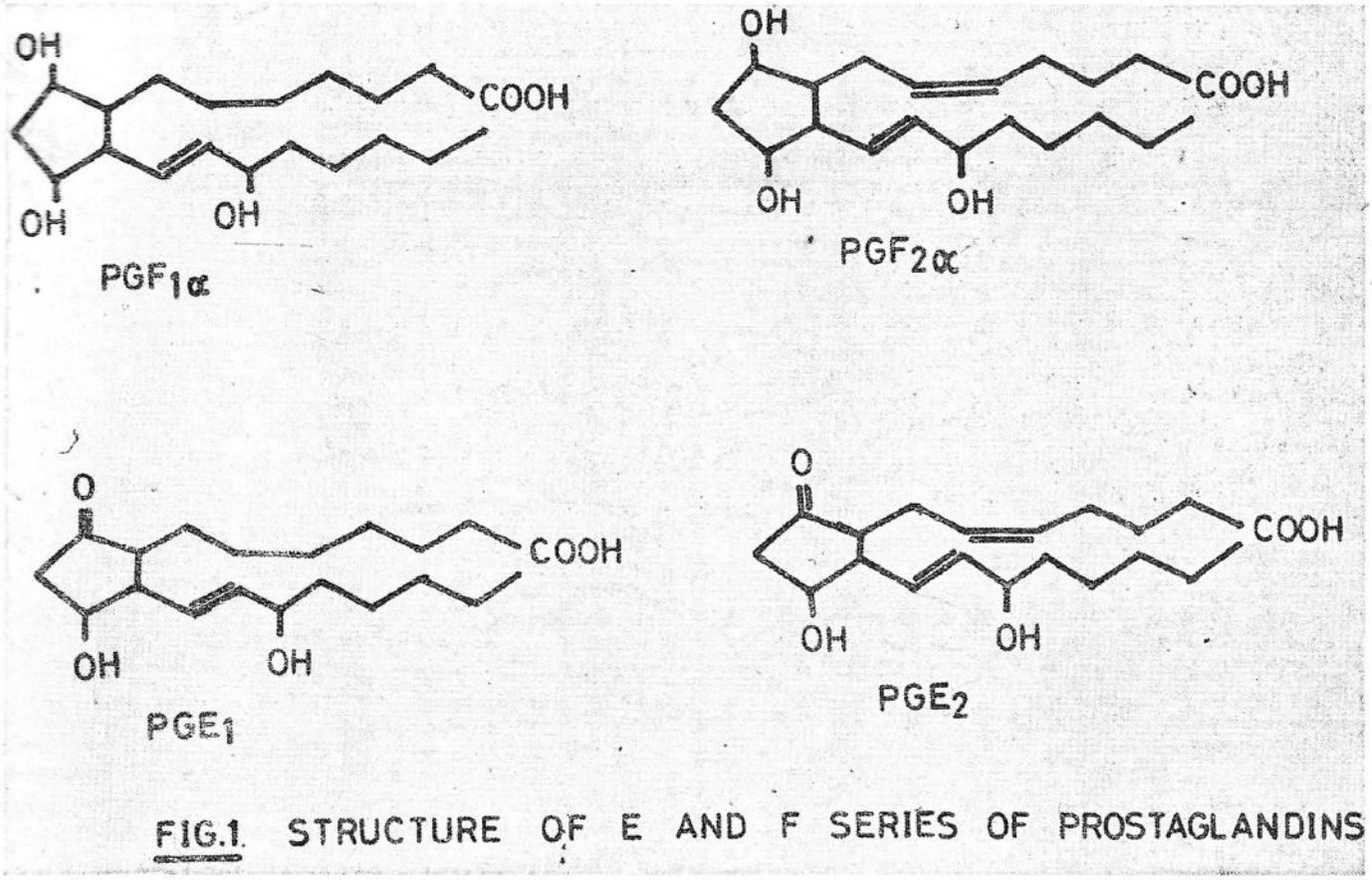


FIG.1. STRUCTURE OF E AND F SERIES OF PROSTAGLANDINS

TISSUE/FLUID	E_1	E_2	E_3	$F_{1\alpha}$	$F_{2\alpha}$	F_3
Seminal Plasma (human)	+	+	+	+	+	+
Seminal plasma (sheep)	+	+	+	+	+	+
Vesicular gland (sheep)	+	+	+	+	+	+
Menstral Fluid (Human)		+			+	
Lung (sheep)		+			+	
Lung (ox)					+	+
Lung (pig guinea, pig, monkey, human)						+
Iris (sheep)						+
Brain (ox)						+
Thymus (calf)	+					+
Renal medulla (rabbit)		+				+

Table I :— Tissues from which prostaglandins have been isolated and identified. (Horton 1969).

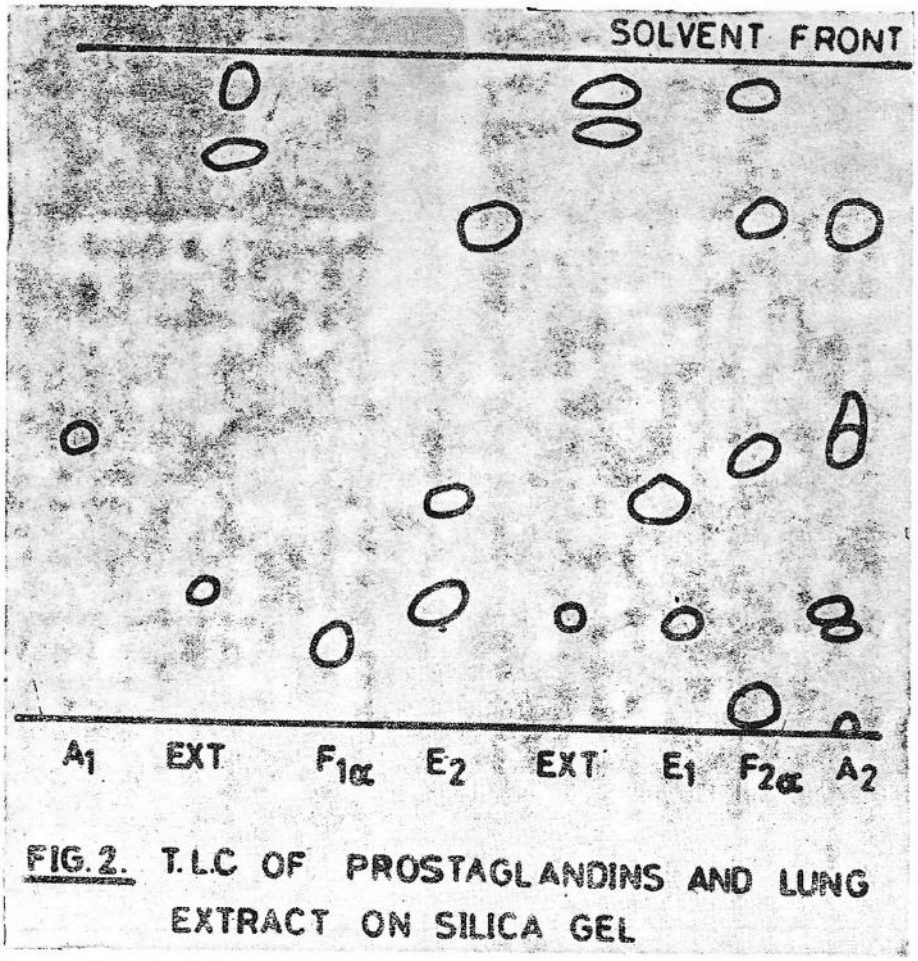


FIG. 2. T.L.C OF PROSTAGLANDINS AND LUNG EXTRACT ON SILICA GEL

Prostaglandin	RF Value
A_1	0.35
A_2	0.20
E_1	0.31
E_2	0.64
F_1	0.1
F_2	0.90
Lung Extract	(*i*) 0.15
	(*ii*) 0.75
	(*iii*) 0.90

Table 3: Rf values of prostaglandins and lung extract.

Benzene/Dioxan/Acetic acid.

of ether after acidification to PH 2.5-3.0. This was repeated twice. The ethereal extracts were pooled and evaporated to an active residue under reduced pressure. The active residue was dissolved in absolute alcohol (1 ml alcohol:1 pair of lungs). Table 2 shows the extraction procedure.

Identification of the Prostaglandins by TLC

TLC and GLC have been used for simultaneous separation and identification of prostaglandins (Ramwell and Daniels, 1963). The type of prostaglandin present in the ethereal extract of the lung was identified using TLC; the solvent system of Anggard and Samuelson (1964). Table 3 shows the Rf values of the prostaglandins. $PGF_{1\alpha}$, $PGF_{2\alpha}$, PGE_1, PGE_2, PGA_1 and PGA_2 were used as the reference. The chromatogram (Fig. 2) was sprayed with concentrated sulphuric acid.

Biological Assay of the Prostaglandin Extract of Guinea-Pig Lung.

The choice of a bioassay system is determined by the type of the prostaglandin to be assayed and the amount present. Since various isolated tissues differ in their sensitivities to the prostaglandins, a tissue sensitive to the prostaglandin to be assayed must be used. The rabbit intestine is preferable for mixtures of prostaglandin E and F since it is sensitive to both. (Anggard and Begstrom, 1963, Bergstrom *et al* 1969). Since guinea pig lung contains mostly PGE, and $PGF_{2\alpha}$ the rabbit duodenum was chosen for the bioassay.

Extracts of protaglandins were obtained from the lungs of 42 untreated and chloroquine-treated guinea-pigs. 16 untreated guinea pigs served as control. Four of the controls were sacrificed at a time and the prostaglandin content of their lungs extracted according to the method of Ambache (1963) and assayed on the rabbit duodenum.

A second group of ten guinea pigs were injected intraperitoneally with 10 mg/kg of chloroquine diphosphate. Two guinea pigs from this group were sacrificed daily (24, 48, 72 and 96 hours after chloroquine administration); their lung prostaglandins were extracted and assayed on the rabbit duodenum. Two other guinea pigs in the group received daily intraperitoneal injections of 10 mg/kg of chloroquine and their lungs prostaglandin extract assayed 120 hours after chloroquine administration.

A third group of guinea pigs were injected with 30 mg/kg of chloroquine diphosphate and after twenty-four hours lung extracts from these were treated as before. Extracts from lungs of these guinea pigs pretreated with 30 mg/kg chloroquine diphosphate caused relaxation of the rabbit duodenum. A fourth group of eight guinea pigs were therefore given intraperitoneal injection of 30 mg/kg chloroquine diphosphate. Two guinea pigs were sacrificed 2, 5, 11 and 25 hours after chloroquine administration and lung prostaglandin extracts prepared and assayed.

Prostaglandin extracts from lungs of untreated and chloroquine-treated guinea pigs were assayed by the Latin Square method on the isolated rabbit duodenum. Tyrode used for the assay contained 2×10^{-7} g/ml of hyoscine, mepyramine maleate and methysergide. $PGF_{2\alpha}$ was used as the standard.

Results

From Fig. 2 and table 3, the TLC and Rf values of guinea pig lung extract, and reference prostaglandins indicate that the extract contains mainly PGE and $PGF_{2\alpha}$ Table 4 shows that the total prostaglandin content per gm of wet guinea pig lung tissue assayed on the rabbit duodenum is equivalent to 4 2.8 $+$ 3.4 $PGF_{2\alpha}$ activity.

Fig 3 shows the effect of graded doses of PGF and prostaglandin extract on the isolated rabbit duodenum.

The prostaglandin content of the lungs of guinea pigs pretreated with 10 mg/kg chloroquine was reduced from 51.5ug, 24 hours after treatment to 18.3ug, 96 hours later. The prostaglandin content of lungs from guinea pigs treated with daily doses of chloroquine for four days was 21.4ug (Table 5).

Extracts from lungs of guinea pigs pretreated with 30 mg/kg chloro-

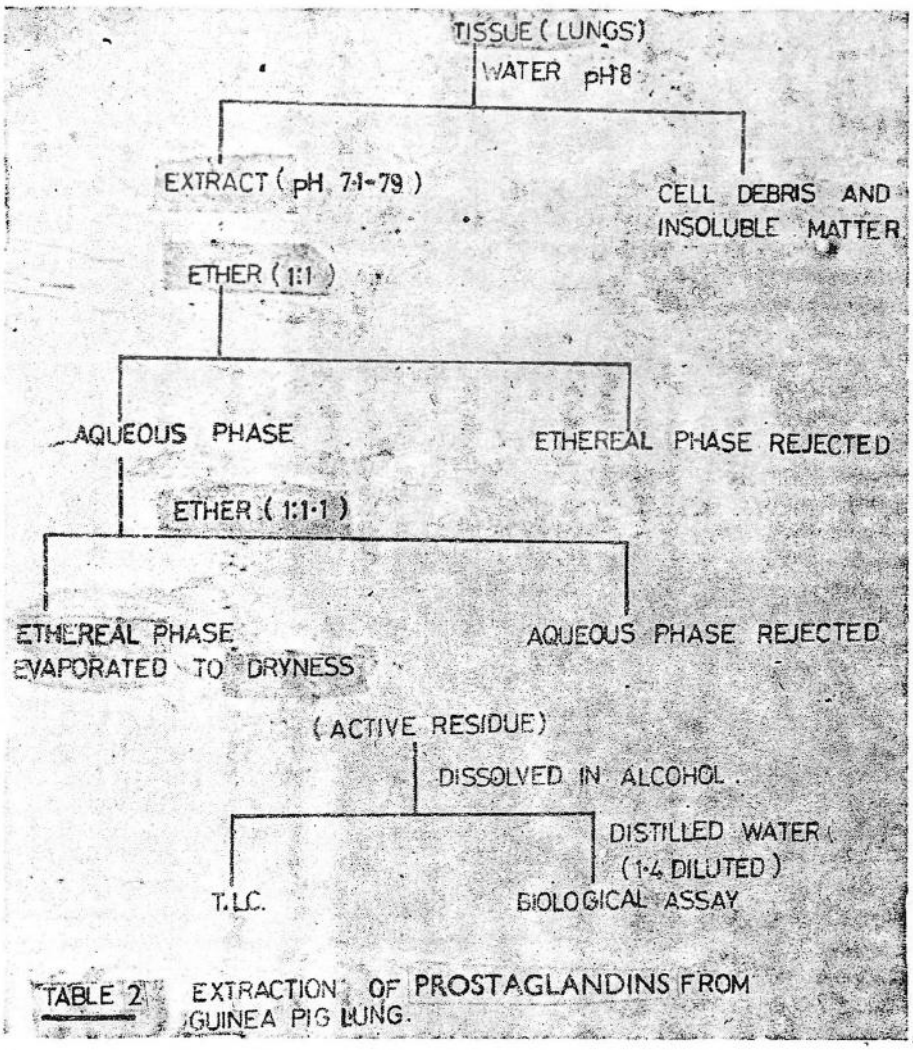


TABLE 2 EXTRACTION OF PROSTAGLANDINS FROM GUINEA PIG LUNG.

FIG. 3. EFFECT OF INCREASING DOSES OF $PGF_{2\alpha}$ AND LUNG EXTRACT ON RABBIT DUODENUM

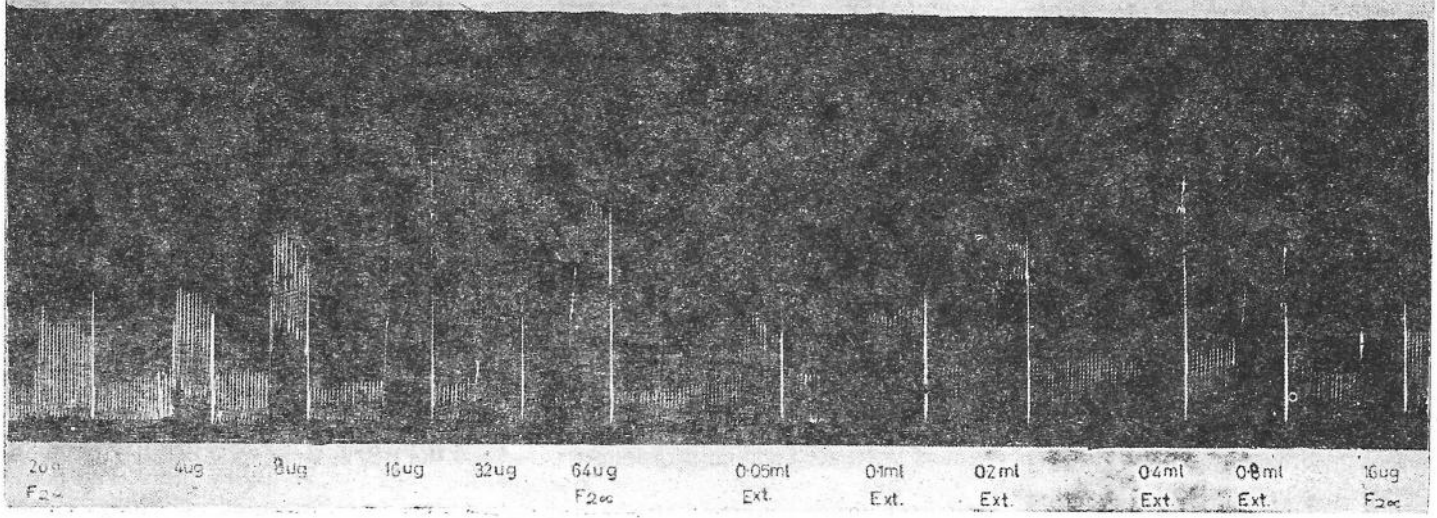
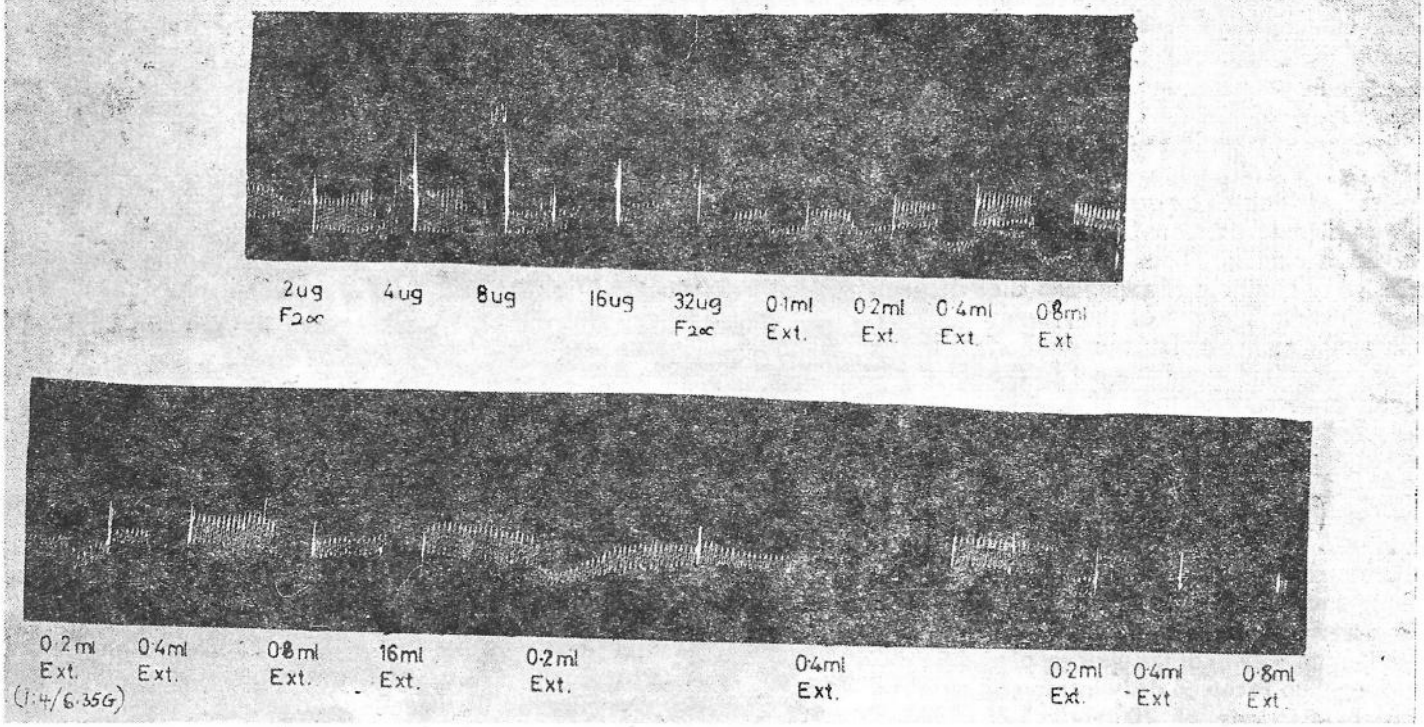


FIG. 4. RELAXANT EFFECT OF LUNG EXTRACT FROM GUINEA PIGS PRETREATED WITH 30mg/Kg CHLOROQUINE



Group of Guinea Pigs	Weight of Tissue GM	Total PG per GM Wet Tissue
1	4.0	40.0
2	15.0	40.8
3	18.0	46.7
4	12.0	43.6

Table 4: Control group of sixteen guinea pigs. Four guinea pigs in each group. The total prostaglandins per gm of wet lung tissue was found to be equivalent to 42.8 $PGF_{2\alpha}$ activity.

Group of Guinea Pigs	Time after Treatment (Hrs)	Weight of Tissue (GM)	Total PG per GM Wet Tissue (ug)
1	24	5.8	51.5
2	48	5.15	45.0
3	72	4.9	24.0
4	96	7.6	18.3
5	120	4.18	21.4

Table 5: Guinea pigs pretreated with 10 mg/kg chloroquine diphosphate, ip. There were two guinea pigs in each group. The last group received daily injections of the same dose for four days.

Group of Guinea Pigs	Time after Chloroquine Treatment (Hrs)	Weight Tissue (GM)	PG $F_{2\alpha}$ Content per GM Tissue (ug)
1	2	8.8	15.8
2	5	8.85	28.84
3	11	6.10	19.45
*4	25	6.3	—

Table 6: All guinea pigs were treated with 30 mg/kg chloroquine diphoshate i.p. There were two animals in each group. The last group received daily injections of the same dose for three days.

*Extracts from this group produced relaxation of the rabbit duodenum.

quine caused relaxation of the isolated rabbit duodenum 24 hours after treatment (Fig. 4) Table 6 shows the effect of 30 mg/kg chloroquine on lung prostaglandins 1-24 hours after chloroquine treatment.

Discussion

The results obtained show that the administration of chloroquine to guinea pigs in doses similar to those given in man (10-30 mg/kg) produces a significant reduction in the total prostaglandin content of the guinea pig lung.

With low doses of chloroquine, this reduction reached its peak, 96 hours after a single dose (10 mg/kg). The reduction produced by 30 mg/kg reaches its peak 12 hours after a single dose. This indicates that the reduction of the total prostaglandin content of the guinea pig lung which follows chloroquine administration is dose dependent.

There was significant difference between guinea pigs that received a single dose of 10 mg/kg chloroquine and those that received daily doses of 10 mg/kg for five days. The fact that lung extract from guinea pigs pre-treated with 30 mg/kg chloroquine caused relaxation of the rabbit duodenum indicates that chloroquine may increase the metabolism of the prostaglandins, in which case, the metabolite may not be detected by the bioassay method employed.

In conclusion, this study indicates that chloroquine causes a significant reduction in the prostaglandin content of guinea pig lung. Since prostaglandins have been associated with defensive reaction, it is possible that prostaglandins may also be associated with pruritus and other "defensive reactions" which follow chloroquine administration.

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GENERIC INEQUIVALENCE AND PHARMACEUTICAL PIRACY*

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On the average, 5,000 new substances have to be tested to find one new drug. Usually out of the 5,000 new substances, only 1,500 remain after initial chemical tests, pharmacological screening and tests for acute toxicity. Of this 1,500, only 30 remain after detailed pharmacological tests and studies, out of which one new drug is found after tests for chronic toxicity and subsequent clinical studies. This journey from 5,000 new substances to one new drug is a long one, often taking years. It involves numerous processes of research and development and joint effort by numerous scientists who are constantly working round the clock. It also involves very huge sums of money. One of the characteristics of research and development in general, and of pharmaceutical research and development in particular is that, as time goes on, fewer and fewer enterprises are able to bear the costs and the risks — and these are quite high. Statistics clearly show that research and development expenditure in the pharmaceutical industry is extremely high, from 10–13 per cent of the turnover. The pharmaceutical industry is one which has to face unusual risks. The sudden discovery of a new therapy anywhere in the world can put a product, on which a great deal has been spent out of the market overnight.

If mankind is to live better in the years ahead then we must redouble the already huge effort going into development of new drugs and improvement of existing ones.

Business is business and the basis of any good business is to make profits, after all the talk about rendering services to mankind, etc., etc. Therefore, after so much money has been spent and so many risks taken to discover new drugs, the inventor must recoup his costs and then make profit later. It is here that the question of patents, generic inequivalence, and pharmaceutical piracy — come in.

What is a Patent? A patent is a a statutory grant by Government or Crown, which confers on an inventor or his legal successor, in return for the disclosure of the invention to the public, the right, for a limited period of time, to exclude others from using the invention. The purpose of the temporary monopoly given by patent is:

1. to encourage research and invention.
2. to enable the inventor to recoup his costs of invention, development, production and marketing of the products.
3. to encourage wide dissemination of technology and know-how, by inducing the inventor to disclose the details of his invention through publication of patents.
4. to provide the incentive for further capital investment in current and future research that will result in further inventions by reducing the risks of the entrepreneur.

Thus when a research — based, reputable company puts up a product on the market and labels it as such, then this is the result of years of investment, research and development. In other words you can believe in the brand.

It is however a known fact that generic inequivalence does exist and this has been adequately documented by various workers. Just what do we mean by generic inequivalence? I shall attempt to illustrate by way of examples.

The value of a drug is determined by its therapeutic efficacy which in turn depends on its bio-availability, which, though not easy to measure, is known to depend on a number of factors e.g. the form of the active ingredient or ingredients, the formulation, taking into consideration the type and amount of binding agents, additives, particle size, etc., etc. Thus two bottles, each labelled, e.g. FRUSEMIDE 40mg containing tablets manufactured by different companies may be said to be generically equivalent in so far as conforming to chemical standards are concerned, say according to B.P. standards. However the two preparations may be found to be very different in such parameters as disintegration time, solubility and absorption and desired therapeutic effect. This has been proved beyond doubt even by some reputable and research-based companies. For

* Presented at the 33rd Ghana Pharmaceutical Conference and Exhibition, 28–30 August, 1975, State House, Accra.

example several tablets, each containing tolbutamide 500mg per tablet with different binding agents manufactured and tested by the same company were found to be "generically inequivalent" with different disintegration times and different bio-availability parameters.

Then there is the other type of inequivalence where certain unethical manufacturers put well labelled products on the market. However, on analysis these drugs are found to contain far less, and varying amounts of the active ingredient or ingredients than what is stated on the label. This type of inequivalence is more prevalent with the antibiotics.

One may then ask why is generic inequivalence so prevalent today? From where and how does it arise. What are its damaging effects on people/patients? etc. These questions will now lead us on to discuss the question of piracy.

There are quite a number of "cheap" pharmaceutical manufacturers who for the purposes of this paper, I shall call "imitators." These imitators are mainly interested in those few medicines which have proved to be commercial successes world-wide. In countries where there are no provisions for patent protection, like Italy, the market is often flooded with a very large number of more or less identical specialities. These companies do not carry out any research work and their products are inferior, substandard and they deteriorate rapidly, not to mention the fact that these products do not often yield the desired therapeutic effect. On the contrary, administration of these products may lead to various complications. All types of cheap imitations of established products like the following are to be found all over West Africa. RASTINON, DIABENESE, LASIX, LARGACTIL, MELLERIL, BUTAZOLIDINE, TERRAMYCIN, PENBRITIN, ALDOMET, SYNTOCINON, etc. In fact there are certain companies that produce so called "generic products" of virtually all established products. International Generics is one such company. I do not condemn "generic products" per se but I condemn in no uncertain terms drugs that are substandard, of dubious quality and are thus "generically inequivalent." Besides, there are so many brands of antibiotics, vitamins, "blood tonics, "energy-pills" etc. of dubious quality and origin, being sold in drinking bars, market places, pharmacies, chemical sellers stores, wayside kiosks, etc, all over West Africa.

One may then ask, what are the special conditions that promote generic inequivalence and pharmaceutical piracy in West Africa. Here are some of the factors that promote pharmaceutical piracy.

1. Indiscriminate manufacture by small to medium-sized companies in countries, like Italy where there is no provision for Patent Protection: these companies do not carry out any research or clinical trials and they do not offer any after-sales services.
2. These companies often sell out very good products at relatively lower prices than the established ones.
3. These companies often send "emissaries" to developing countries with messages of goodwill to negotiate with Government functionaries and purchasing officials for large orders in exchange for various courtesies — Following is a stereotype "goodwill message" — "You know your Government has been spending so much money in importing this product from these companies. We are prepared to supply you with our own brand which is just as good and costs 30–50 per cent less. Besides we give you better credit facilities." Needless to say, the 30–50 per cent arena provides a suitable playground for tossing percentages around in both local and foreign banks.
4. Inadequate importation controls or virtual lack of it in developing countries make it possible for any Tom, Dick and Harry to import whatever he likes and from wherever he likes. These unscrupulous importers (usually rich illiterates or greedy businessmen, sometimes in collusion with misguided pharmacists and some Government Officials) then sell the "cheap products" anywhere they like, anyhow they like and at whatever price they like. This is possible because of laxity in the enforcement of the Laws governing the practice of pharmacy, where such laws exist and also due to the fact that the law enforcing personnel is inadequate and often times corrupt.
5. In developing countries where health-care delivery personnel are grossly inadequate, self medication is very prevelant and the pirates engage in the most unethical forms of advertising and promotion to sell their unwholesome drugs, with impunity. This situation is made worse by quack drug peddlars who infest the towns and villages, selling aspirins and vitamins as though they are panaceas at exhorbitant prices. They also sell dangerous drugs as if they are tins of sardines.
6. Underlying all the above points is the question of illiteracy and ignorance among the generality of our peoples.

What are the effects of generic inequivalence and pharmaceutical piracy on our people and economy and what can we do to curb this cancer?

Indiscriminate use of antibiotics, inappropriate self-medication as well as ingestion of drugs that only provide sub-theraceutically effective blood-levels result in conditions we are all aware of, including breeding of more and more resistant strains of bacteria, various complications, various drug interactions, worsening of disease states, and sometimes drug poisoning and death. Money is wasted in buying large quantities of drugs that will either deteriorate in no time, or which Doctors will not prescribe because of inefficacy and bad tolerability. Piracy is a corrupt practice and those who indulge in it are corrupt and breed corruption. Scarce foreign exchange is used in ordering useless drugs from the "ambassadors of goodwill" and helpless, innocent patients are helped to get worse when they are sick or helped to die quickly by some unscrupulous quacks who may recommend the worst drugs for the patients.

What can we do to curb this cancer? We, as Pharmacists, and as custodians of drugs must do all we can, at least to minimise the occurrence and effects of generic inequivalence and piracy. In this connection, I would like to make the following propositions:

1. The Pharmaceutical Societies should endeavour to embark upon more aggressive programmes aimed at educating the public on the hazzards of the indiscriminate use and misuse of drugs by way of symposia, public lectures, write-ups in the newspapers, talks on radio and television.
2. There should also be joint effort by the pharmaceutical societies and Medical Associations to encourage their members to desist from acts that make it possible for drugs to reach wrong hands. Anything short of this will gradually but severely wipe out whatever respect and confidence we may presently be enjoying from the public.
3. The authorities in the various countries should embark upon a vigorous exercise of registration of drugs and drugs that are of dubious quality and of no use should be banned outright.
4. Importation of drugs should be rigorously controlled and the authorities should satisfy themselves as to the usefulness and quality of drugs before permits are granted for the drugs to be imported.
5. More Pharmacists should be tarined.
6. More pharmacists should be employed to augment the number of law enforcing personnel (inspecting pharmacists and the like) who should perform their duties without fear or favour and defaulters should be promptly and severely dealt with according to law.
7. Unethical advertising of drugs should be stopped.
8. There should be a general formula worked out based on the C & F or C.I.F. prices of imported drugs and prevailing economic trends, making allowance for a reasonable and fixed margin for the importers so as to arrive at retail and wholesale prices which can therefore be readily checked at all times with a view to controlling the price of drugs.
9. Patent protection should be instituted.
10. Finally we should all have a sense of dedication and devotion to duty. We should purge ourselves of all tendencies of excessive greed and to uphold the highest ethical standards which our profession demands of us if we are to be the real friends of our peoples as exemplified by the motto of the Pharmaceutical Society of Ghana: "AMICUS HUMANI GENERIS." Thank you.

PHARMACEUTICAL PLANT MANAGEMENT IN RELATION TO OTHER INTERNAL DEPARTMENTS IN AN INDUSTRY*

By Dr Yousef Hafez Daoud—Plant Manager, Pharco Productions Limited, Accra

Mr Chairman, Distinguished Guests, Ladies and Gentlemen, it is with great pleasure that I am addressing you this morning. I have chosen to speak about Pharmaceutical Plant Management which in our days has developed into quite a sophisticated and rather complex structure. I would like to mention here, as it is known to all of us, that good management in any industry is the measure of the success of the business.

We must admit that pharmaceutical industry being a vital sector since it is dealing with people's health, the management of such a sector must have strict guide-lines and proper organization in order to protect the industry from haphazard management that might lead to fatal mistakes as have happened in some cases in the past.

I am going to stress on the Plant or Factory Management with its different structures and the relation of the departments and sections involved to achieve their one goal: "a quality product that is economically profitable to the industry."

The main sections or departments depending on the size of the plant are:

- Production
- Quality Control Laboratory
- Materials Department including Purchasing, Production Planning, Inventory Control and Stores.
- Maintenance.
- General Services.

Production

The Production department headed by the Production Manager, who reports to the Plant Manager, constitutes the largest section in a Plant as regards to the budget, size and people involved.

The production department is constituted of three major sections, namely: the compounding section, the packaging section and the sterile area. The reason for this subdivision is to have clear classification at any particular stage of manufacturing of the drug. It is essential in the compounding stage for all raw materials to be channeled under strict controlled conditions such as temperature, relative humidity and sterile area for all the different dosage forms of a drug, be it a tablet, a syrup, injectable, etc.

The Compounding stage starting with the raw materials which will end in the form of tablet, capsule or syrup will be taken up by the packaging section for the over-printing and packaging operations. I should admit here that this theoretical classification has been to some extent merged in case of completely automated lines yet such conditions for the compounding of drugs is still being maintained.

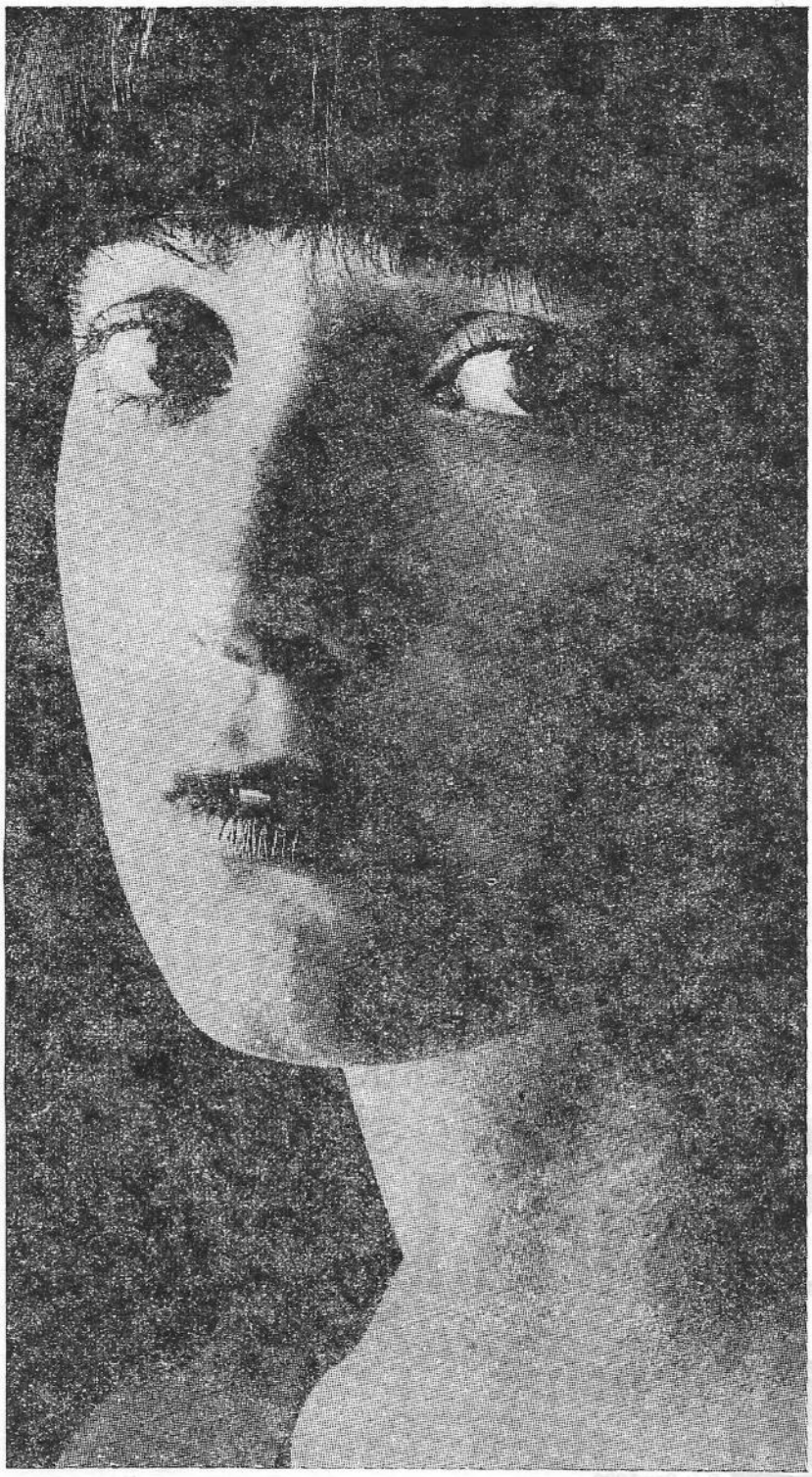
The sterile area being a very sensitive section of Production where all sterile fills are manufactured under aseptic conditions is usually administered with great care by a highly qualified and skilled personnel. Such costly precautions taken in manufacture of sterile products is not a mere requirement but rather an essential economic factor as contamination in sterile products can be disastrous to the industry.

It is essential in production to fall in the good manufacturing practice which is a must in pharmaceutical industry. A simple example of such practice is to assure that all equipment being used in producing a batch of drugs should clearly be labelled at all times to identify fully

* This paper was presented at the 33rd Ghana Pharmaceutical Conference and Exhibition, 28–30 August, 1975, State House, Accra

THE DISTRESSING ITCH

BROUGHT HER TO YOUR OFFICE...



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Triple Action Tricofuron

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- Reliable topical therapy.
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SENSITIZATION occurs infrequently. If burning, pruritus or erythema increases, the patient should discontinue treatment, take a cleansing douche, and report to her physician. Simple, Two-Step Treatment

(1) TRICOFURON (furazolidone and nifuroxime) Vaginal Powder for office use, contains FUROXONE® (furazolidone) 0.1% and MICOFUR® (nifuroxime) 0.5% in an acidic, water-miscible base. 15 Gm. plastic squeeze bottle with 5 disposable applicator tips (ask your Eaton representative for a complimentary supply).

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IMPORTANT—During treatment, patient should refrain from intercourse or partner should use protection. Continue use of suppositories during menses, introducing with aid of tampon or applicator. Treatment should be continued throughout a complete menstrual cycle and for several days thereafter and for at least one week after no trichomonads can be found microscopically. Microscopic examination of the vaginal smears should be conducted at monthly intervals for several months.

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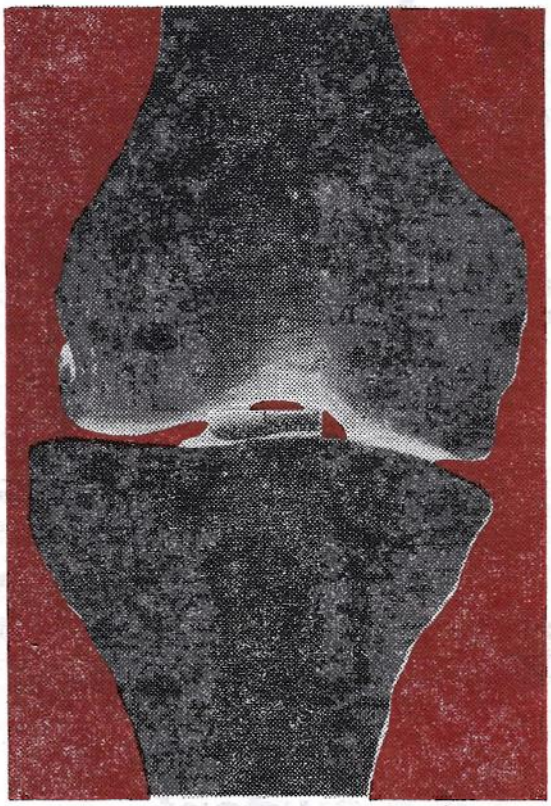
'Orudis' in arthritis



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.

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.

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

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and accurately their contents, batch number and the stage of processing.

This is a tedious task of training and education to all who are in direct contact with drugs. The practice of protecting the drug from those involved in producing it and vice versa is an essential factor at this stage. One of the gravest threats and menace to the industry is contamination and mix-up that can happen during manufacturing unless strict control and guidelines are adhered to in production. It goes without saying that proper housekeeping and cleanliness is a factor that one could not ignore or neglect during all phases of the industry.

Quality Control

The quality control department has a very vital role in the pharmaceutical industry. The old saying that Quality and quantity do not go together cannot be verified in modern industry.

The quality control department is a department to safeguard all manufactured drugs and assure the launching of a quality product that meets its label claim on the market. This department has tremendous responsibilities and the quality control manager should not be biased nor pressured to release a pharmaceutical product unless he is completely satisfied of all his data. Because of the many stages a particular product undergoes until it is in its final form, the quality of the product must be followed at all stages by the in-process control to insure its quality before it reaches its final form. This measure although being ignored by some firms that are satisfied by running tests on finished products only, I personally feel that it is economical to check the product in all its manufacturing stages starting from the raw materials to the finished products, so that any deviation detected at any particular stage will save the product from complete destruction.

Depending on the size of the Plant, the Quality Control Manager because of the nature of his job will report to the Plant Manager or the Technical Director and in some cases he will report to the Central Control Lab. in case of large firms with several manufacturing facilities.

It is essential that the Quality Control Manager be completely objective and not involved with sales pressures and marketing politics, his personal judgement will play a big role in the release or rejection of many products in spite of all specifications, specially in developing countries.

The relation between Quality Control and Production should be classified and programmed in a way to give reasonable time for testing and checking all raw materials, packaging materials, in-process control and finished goods. Reference samples and documentation of analytical, microbiological and chemical testing are to be properly filed for each and every batch produced in the plant. The launching of new or modified formulations should be cleared after the stability testing by this department.

Materials Department

The Materials Department headed by the Materials Manager who in turn will report to the Plant Manager, is responsible for the supply, planning and storage of all materials utilized in the industry. This is rather a new classification where three sections: namely: Purchasing, Production Planning, Inventory Control have been combined in one department, yet each section has its own functions.

The plan of action from which the Materials department should start is the Sales Forecast which is to be submitted by the Marketing Department indicating the quantities of pharmaceuticals and delivery timing required for a fiscal year. These quantities are then taken and broken down into raw materials, packaging materials and matched against the Plant equipment utilization for study in case of an increase or a decrease in Plant capacity, Such programming will be reflected on the budget and once established should be closely adhered to and a minimum of three months stock level should be always maintained throughout the fiscal year.

It is the responsibility of the PPIC to see that purchase orders are issued, giving a lead time to the purchasing section, where a comparison of prices is to be accomplished prior to purchasing in order to establish any cost inflation which might affect the margin of profit of any one product.

It is also important to emphasize the basic function of the PPIC as regards the schedulling of a daily, weekly, monthly, quarterly and yearly programming for production. I can only say that it is only with such proper forecast studied plans that a Plant can at any moment be in a position to indicate its capacity and financial status at any time during the fiscal year.

The stores are to be clearly classified into:—

— Raw materials Stores
— Packaging Stores
— Finished Goods Stores
— Quarantine area

with tight stock keeping system and organized channels of issue and receipt of materials, where assurance of no mix up of materials nor wrong labelling could occur.

Storage conditions for pharmaceuticals must fulfil requirements such as sanitary conditions, temperature, humidity and stock rotation.

A quarantine area for all pending batches awaiting release is to be designed in a way to avoid mix up, specially that some products in the quarantine area are in semi finished form.

I would like to emphasize here that no product in all stores, whether being a raw material, packaging material or finished product, should be released from such stores unless it has been cleared by the Quality Control Laboratory. I should also mention here that physical inventories be taken at random for different products in different stores on monthly basis which is followed by a complete inventory for the whole Plant once a year.

Maintenance

The Maintenance section headed preferably by a qualified Engineer who will report to the Production Manager is considered the backbone of production. In order to establish an efficient workshop, qualified mechanics and technicians should be employed specially in case of automated Plants where sophisticated machinery needs high technology and proper maintenance for daily runs.

The workshop should be equipped with all necessary tools and equipment in order to repair any breakdown in any of the Plant machinery as delay in repair can be very costly.

There should be a monthly and yearly programme for the mainten-

ance of all machinery in the Plant, this will include boilers, air-conditioners, air-filters, dehumidifiers, etc., apart from pharmaceutical machinery.

There should be a reporting system and recording of all repairs performed on all equipment.

The ordering of spare parts and workshop requirements should be handled by the Plant Engineer and approved by the Production Manager.

General Services

In a manufacturing unit there should be a person responsible for General Services of the Plant, who will report to the Production Manager. The responsibilities of the General Services are:

1. The good housekeeping in the Plant.
2. The catering and provisions in case a meal is provided in the unit.
3. The supervision and schedulling of security measures.
4. The handling of laundry and uniforms for staff.
5. The supervision and control of company vehicles and drivers.
6. The organization of Plant festivals, Parties and Open houses.

This has been a very brief outline of the main structure and functions of the different sections in a pharmaceutical Plant yet I feel that the binder to the whole set-up is the budget.

The Budget

There is no question that any company cannot achieve its goals without establishing a challenging budget. The budget should be reviewed on quarterly basis. The budget will cover every section in the industry and will be the guideline for every investment and expenditure.

I would like to sum up by saying that the human relations and goodwill between individuals bearing such responsibilities is an important element in the success of the organization and the approach of Management towards organizations such as Labour Unions and Syndicates should be an approach of understanding and cooperation.

I would like to thank you all for your kind attention and would welcome any question on the subject.

Thank you.

REQUIREMENTS FOR REGISTRATION OF RETAIL PHARMACY PREMISES

1. Applicant should duly complete application Form No. 10 (Reg. 12) obtained from the Registrar of the Pharmacy Board. The name and registration number of the Superintendent Pharmacist should be supplied.
2. Premises should be neat with washable walls and floors.
3. Appropriate shelves and show-cases should be provided to ensure proper storage of drugs.
4. A DANGEROUS DRUGS CUPBOARD should be provided.
5. A DISPENSARY if present should be partitioned from the area of the Pharmacy open to the public. It should be supplied with a sink and running potable water.
6. There should be a Dangerous Drugs Book and a Prescriptions Book as prescribed by the Act on the premises.
7. The following equipment must be provided:
   (i) Refrigerator
   (ii) Pestles and mortars (appropriate)
   (iii) Scales
   (iv) Measures (appropriate)
8. There must be a Facial Board indicating the name of the Pharmacy and a notice showing the hours of business.

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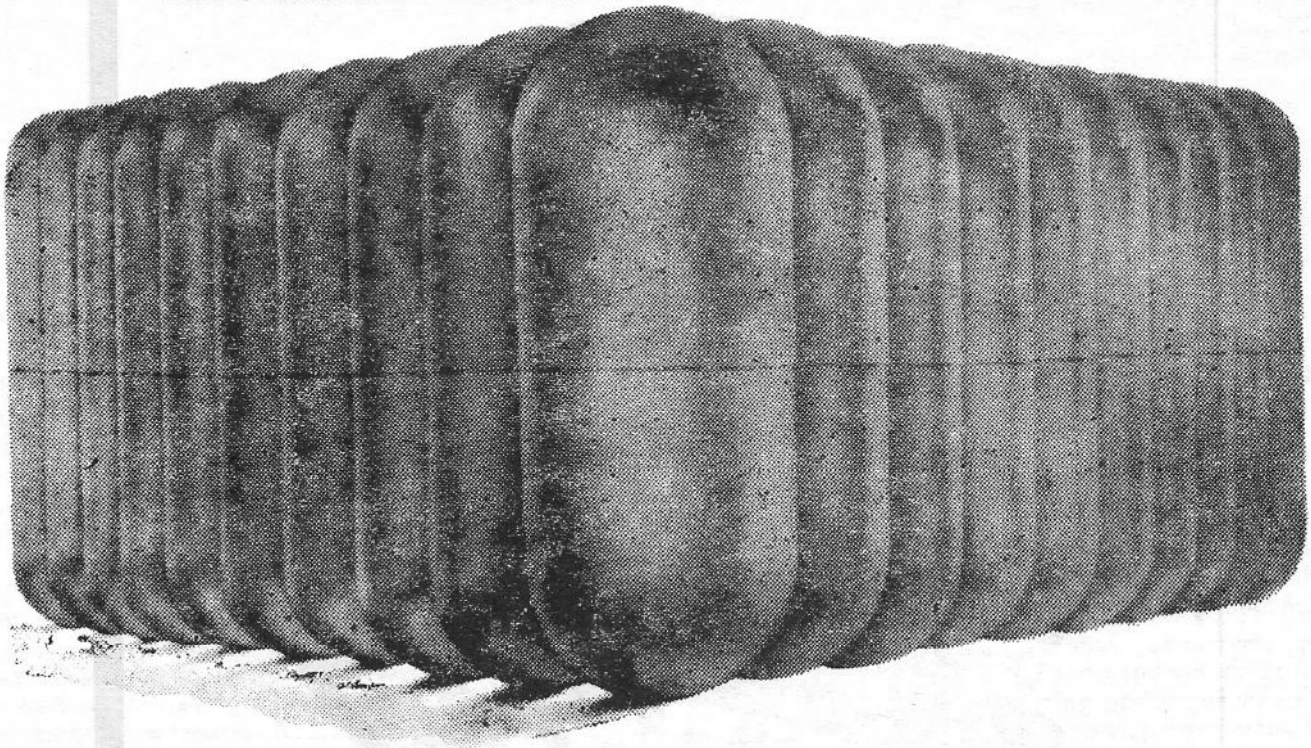

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PHARMACY MANAGEMENT*

By E. O. Gyamfi, M.P.S.G., Managing Director, Bikkai Ltd., Kumasi.

Chairman, Ladies and Gentlemen, it affords me the greatest pleasure to talk to you this evening on the subject of Management, its concepts and significance in the practice of Pharmacy.

Why is it significant to a Pharmacist? According to my own experience, as a newly qualified Pharmacist, I found myself at a great disadvantage when I first joined U.T.C. in 1956 as their Resident Pharmicist/Storekeeper — combining my chosen profession and commerce. At this place, I was introduced to a new profession whose terminology I did not understand. I was earmarked, however, to head their Pharmacy Department. At that time we did not have any opportunity of learning management principles and theories as applied in commerce. Owing to the lack of knowledge in commerce and my employers realized this, I was placed under a Clerk as my trainer. That was the time I felt the need to learn management principles and theories. Having caught up with the new management concepts within a few months time, I was placed at my proper position.

Pharmacy as you and I are aware is a profession but immediately you enter into retail/wholesale and manufacturing business, then you carry on simultaneously, the responsibilities of a professional pharmacist and the duties of a businessman. And therefore as a businessman you will be required to perform certain managerial duties. For instance, if you become a Branch Manager of a Pharmacy you will be required to perform two functions: namely the pharmacist function and the function of a manager. The first function as a pharmacist or a professional man, is the formulating and compounding as well as dispensing of drugs, advising Doctors and the general public on the proper use of drugs. You must also keep a Register of Poisonous drugs as contained in the Drug and Pharmacy Act.

The second function as a Manager is to be responsible for proper care of the Company's property both capital and current stocks of the branch and to ensure that the branch gets a fair share of the existing market and makes profits so that it will grow, expand and survive.

The Manager also acts as a marketing intelligence agent by furnishing his boss with information pertaining to commission and other marketing policies.

The Pharmacist/Manager must ensure up-to-date records of all daily transactions at the branch; i.e. filing of debit and credit notes, waybills and the posting and checking of ledger entries.

Looking at the foregoing, Managers who are promoted from the ranks of their own specialisation to accept wider responsibilities in a senior executive post, find that they are often at a disadvantage when called upon to express opinions on matters of finance, marketing, etc., because of their lack of understanding of the basic principles of business management.

MANAGEMENT

Definition

Management is primarily setting objectives and making decisions to attain these objectives. Management concerns itself with the most efficient use of:

- Men
- Money
- Materials
- Machines
- Methods and
- Markets

to accomplish a predetermined objective or objectives.

The fundamental job of management is to:

1. Visualize results desired; interpret needs and markets; forecast significant trends and identify major problems.
2. Establish objectives, policies, Criteria and standards for measuring performance, to formulate plans, programmes, budgets and related management controls.
3. Attain results through people; build and maintain a sound organisation that is completely staffed, directed and motivated.
4. Look for improvement; appraise results, make decisions and effect remedial action; and
5. Help subordinates to develop; understand people; inspire confidence, promote teamwork; maintain respect, discipline, training and high morale.

MANAGEMENT AND ORGANIZATION

1. What do we mean by Management?

Management embraces all duties and activities that relate to the initiation of an enterprise, its financing, the establishment of all major policies, the provision of all necessary equipment, the outlining of the general form of organization under which the enterprise is to operate and the selection of the principal officers of the enterprise.

* This was an address delivered to Pharmacy Students of the University of Science and Technology, Kumasi.

2. What is the job of Management?

(*i*) The manager must be able to interpret his customer's needs and the potential markets for the organisation's services. He must always be able to evaluate the current operating position of his enterprise and to identify and forecast significant areas and trends and the problems that are related thereto.

By forecasting, we mean foreseeing, or foretelling future or contemplated action, interpreting what future results are going to be in say one, two or five years hence based upon past performance and foreseeable changes and determining what areas to make strategic decisions.

(*ii*) The second job of management is to develop and establish objectives, policies, budgets and whatever other basic controls are needed for administering the organisation's affairs most effectively.

To do this most effectively, the chief executive or the General Manager must coordinate and direct the abilities of his staff. He must be able to utilize the group thinking of his staff, use consultative management and other modern management techniques available.

Objectives are the goals we hope to attain: the end result. Every organisation needs to periodically review and clarify its objectives; to ensure that when its objectives are attained, they will satisfy all concerned.

(*iii*) The third job of management is to attain results through people. This requires an entirely different set of skills than those required if we are to get results through our own efforts. The skills required include:

How to plan, lay out and make work assignments effectively,
How to teach and instruct;
How to maintain good human relations;
How to delegate responsibility and to maintain controls;
How to conduct conferences;
How to utilize effectively group thinking; in the solution of company problems.

(*iv*) The fourth job of management is to look for improvements continuously. This requires awareness, the desire to make improvements and skill in appraising performance for conformity with established criteria and standards; to recognize and initiate the need for changes and to effect remedial action wherever this is necessary. It needs the capability to break down each job for which an executive or supervisor is responsible and to answer the following questions:

What is the purpose of this job?
Is it necessary?
Where should it be done?
When and who should do it?
How should it be done?

Improvements require change and even though change is often painful, there is no improvement except through change.

(*v*) The fifth job of management is to develop your subordinates. This job requires another set of special skills and abilities such as

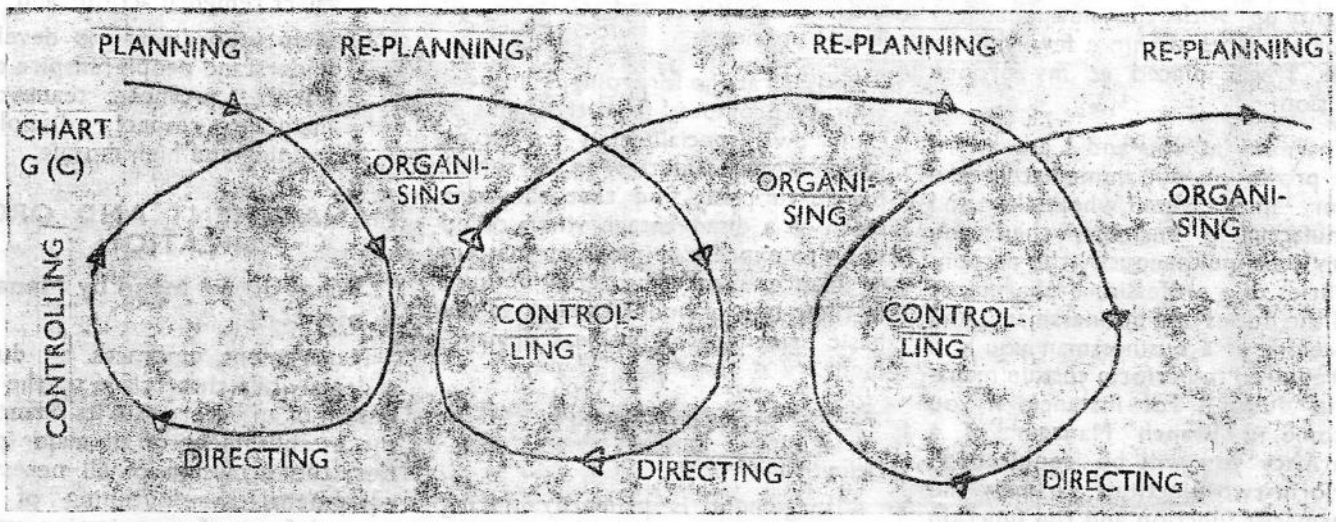
(*a*) how to secure the highest productivity with minimum of efforts
(*b*) how to conduct individual appraisals of work performance
(*c*) how to provide individual guidance and counselling
(*d*) how to conduct effective personal follow-through until job satisfaction and desired improvements are accomplished.

Some of our basic management problems arise from causes such as:

1. Lack of clear-cut objectives and policies
2. Lack of adequate management controls
3. Lack of significant criteria for measuring results.

THE ELEMENTS OF MANAGEMENT

The elements of management interact in a continuous process which can be represented diagrammatically as below:—



Planning leads to organising; to directing; to controlling and back to planning.

Planning

3.1 Without going into depth of detail PLANNING may be defined as "the analysis of information from the present and the past and an assessment of probable future develop-

ments so that a course of action—the PLAN—may be determined to enable the organisation to meet its stated objectives." (Ref. "Principles of Management" by H. L. Sisk).

3.2 Planning may on occasion, be the only part of the process of management to be performed. This seems to be a paradox. But there may be times when a plan, once formulated, shows that no future action is needed. Alternatively, the decision may be made that the plan is not possible, possibly temporarily, or that no further action can or should be taken. In such a situation the other elements in the process of management are ignored.

3.3 When, however, planning shows that other action is needed it is the initial stimulus from which all the others stem.

3.4 Planning affects organising, in that it is needed to define the structure; the personal and responsibility relationships; the authority and information networks; the scope of the individual interlinking units; and the individual accountability.

3.5 It affects directing through the factors of size of organisation; the objectives of the enterprise in relation to the needs and aims of the individual; the capacities and requirements of the component parts, the sitting and nature of the information exchanges required and the extent to which goals are to be achieved.

3.6 Planning provides the basis for control. The plan sets down what is to be achieved. Control measures what has to be done and initiates action to remedy variations.

3.7 Planning is itself based on objectives — on what the organisation aims to achieve. Decisions on this are as much a part of the planning process as the drawing up of the plan itself and its alternative courses of action. For without knowing what is wanted it is impossible to plan to achievement.

Organising

4.1 ORGANISING may be defined as the activity of structuring or organising the parts of an enterprise in order that it may achieve its objectives. There are three items which have to be arranged in this way. They are:—

4.1.1. the work to be done and the analysis of the work into individual tasks;

4.1.2. the individuals who are to carry out the tasks; and

4.1.3. the systems by which they will operate and the relationships between jobs and between individuals.

It is clear from the above that staffing (considered by some as a separate part of the process) is an integral part of the element of organising.

4.2 The three entities — work; people and systems represent three different schools of thought about theories of organising.

4.3. The theoretical background to the assumption that it is work which has to be arranged is known as Theory X. This is the traditional or classical approach. It depends on four underlying suppositions, namely:—

4.3.1. People have to work to live. It is distasteful and onerous.

4.3.2. The average man will avoid work if he can;

4.3.3. Because a man does not like work he has to be coerced, and made to work by threats of punishment or deprivation and fear;

4.3.4. Man in general wants to avoid responsibility; likes to be told what to do and to have his problems solved. He is not ambitious.

4.4. An organisation based on this theory will tend to be rigid and authoritarian, depending on fear and compulsion for its effectiveness.

4.5. The "person centred" approach is based on Theory Y. Organisation based on this theory will tend to be participative, with willing, intelligent people co-operating to make the organisation achieve its objectives successfully.

4.6 There are six assumptions underlying Theory Y. These are:—

4.6.1. Work is as natural to human beings as recreation and should be just as enjoyable;

4.6.2. A man will exercise self control and self-discipline in attaining a goal to which he has committed himself;

4.6.3. Self realisation and the satisfaction of achievement are directly connected to efforts made toward attaining objectives;

4.6.4. If the "climate" is right a man will seek responsibility rather than shirk it;

4.6.5. Imagination, creativity and ingenuity are widespread human capacities which need only the right atmosphere in which to grow.

4.6.6. Under current conditions in business and industry a great deal of human intellectual capacity is wasted.

4.7. The systems approach is some times known as theory Z. It considers the organisation as a unified whole made up of inter-related parts where the whole is greater than the sum of the parts in the same way as a man is more than just a combination of arms, legs and so on. The systems concept of management sees organising as a self correcting system with feedback resulting in action to regulate and correct variances from the objectives for which the organisation was set up.

4.8. Five variables which determine the suitability of any organisation structure under this theory are as follows:—

4.8.1. the structure size, with larger structures more authoritarian;

4.8.2. the degree of inter-action between members. This governs the participation aspects;

4.8.3 the personality of members;

4.8.4. the level at which decisions are taken. If decisions are close to the work participation will be greater; and

4.8.5. the state of the system. The nearer the organisation is to achieving its goal the less authoritarian the structure can become.

DIRECTING

5.1. The common attribute of directing is its concentration on the human aspects. The various component parts are motivation; leadership; stimulation; guidance; development and training; discipline; incentive and so on.

5.2. Methods of directing can vary from highly participative to extremely authoritarian. Several factors influence choice of the appropriate means, among them being the following:—

5.2.1. the size of the organisation. The larger it is the more authoritarian it will have to be;

5.2.2. the capabilities, capacities and needs of the individual members. If they are on the whole self motivated then direction will be looser and more participative.

5.2.3. the relationship of individual and enterprise objectives. If they are in harmony indirect directing will be sufficient. Close supervision will be needed if these aims conflict;

5.2.4. the extent to which objectives are being achieved, knowledge of achievement makes direct authority less necessary.

Control

6.1. CONTROL consists of the following elements:—

6.1.1. establishing standards of performance;

6.1.2. measuring the performance;

6.1.3. comparing performance with the standards set; and

6.1.4. initiating and following up action needed to correct deviations from the standards or plans.

6.2. To understand control needs understanding of three main elements:—

6.2.1. the nature of control;

6.2.2. What is controlled and

6.2.3. Who controls.

6.3. Control is checking to determine whether plans are being observed and whether appropriate progress is being made toward the attainment of objectives. It is also action to correct any deviations which may be revealed. It is not just a passive process. In many instances such action may involve revision of plans, additional organising and improved staffing and better system of directing. It is a means of closing the loop of the entire management process.
6.4 It becomes necessary whenever a manager delegates authority to a subordinate. His responsibility has not been lessened by so doing. In essence it has been increased because he must now exercise control over the actions taken by his subordinate under his—the manager's—delegated authority. The manager controls adherence to the objectives, plans, policies, organisational structure, procedures and so on as they have been laid down.

6.5. It seems clear that the person who is responsible for the results should be the person who exercises control. In other words, whoever lays down what has to be achieved has ultimately the responsibility for controlling adherence to it. He is responsible therefore for such corrective action as is needed. As a corollary to this authority for managers to establish standards should be delegated as far down in the organisation as practical wisdom and experience permit.

The Process of Management

The Process of Management consists of four fundamental functions. These four main interdependent concepts combine in various ways to make management a continuous process. The four main interdependent aspects of the process of management are:

Planning
Organising
Directing or Actuating and
Controlling.

There are also three elements common to all four parts of the process, namely:
Decision-making
Problem solving and
Innovating

These activities are the means—the processes through which the Manager manages. These are the distinguishing functions that tell a manager from a non-manager.

Planning: is used to determine the objectives and the courses of action to be followed.

Organising: to distribute the work among the group and to establish and recognise needed relationship and authority.

Directing: the members of the group to carry out their prescribed tasks enthusiastically and

Controlling: the activities to conform with plans.

According to Koontz and O'Donnell, . . . Presidents, department heads, foremen, supervisors, college deans, bishops and heads of government agencies while acting in their managerial capacities, all do the same thing . . . "

This statement should of course be qualified as the non-managerial skills required for various managerial posts vary from job to job.

The Work of Managers

The work combination performed by managers varies according to the organisational level of the manager. Managers on higher levels tend to spend relatively more of their time performing managerial functions than do managers on lower levels in the organisation.

UNIVERSALITY OF MANAGEMENT FUNCTIONS

These managerial functions are performed in all types of organisations, formal and informal. It was Fayol's proposition about the *Universality of management* functions that made him famous.

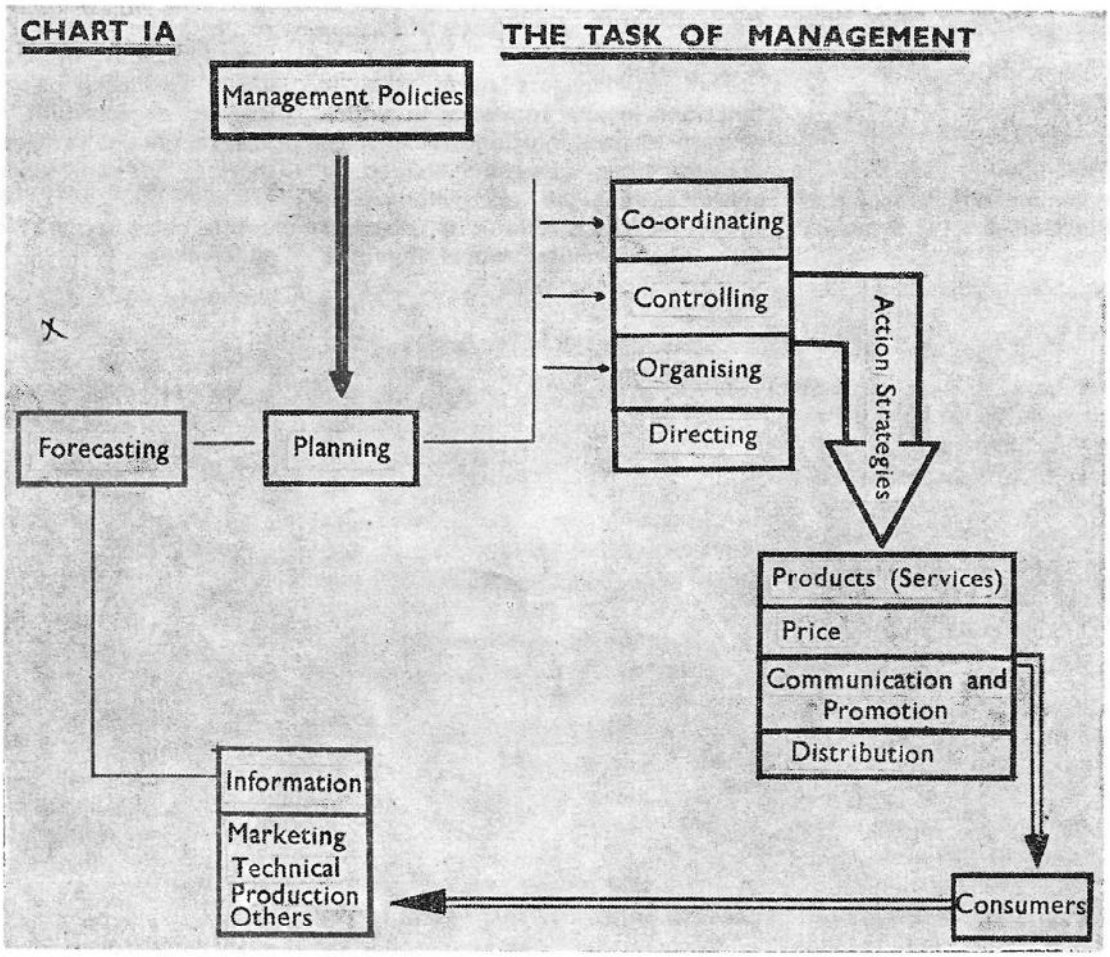
The thesis here is that managerial functions are essentially the same regardless of the type of organisation or the level of the manager in the organisation. This means that a manager, when he is creating, planning, organising, directing and controlling does essentially the same work regardless of the objectives of his organisation, his particular activity and his rank in the organisation.

Transferability of Managerial Skills

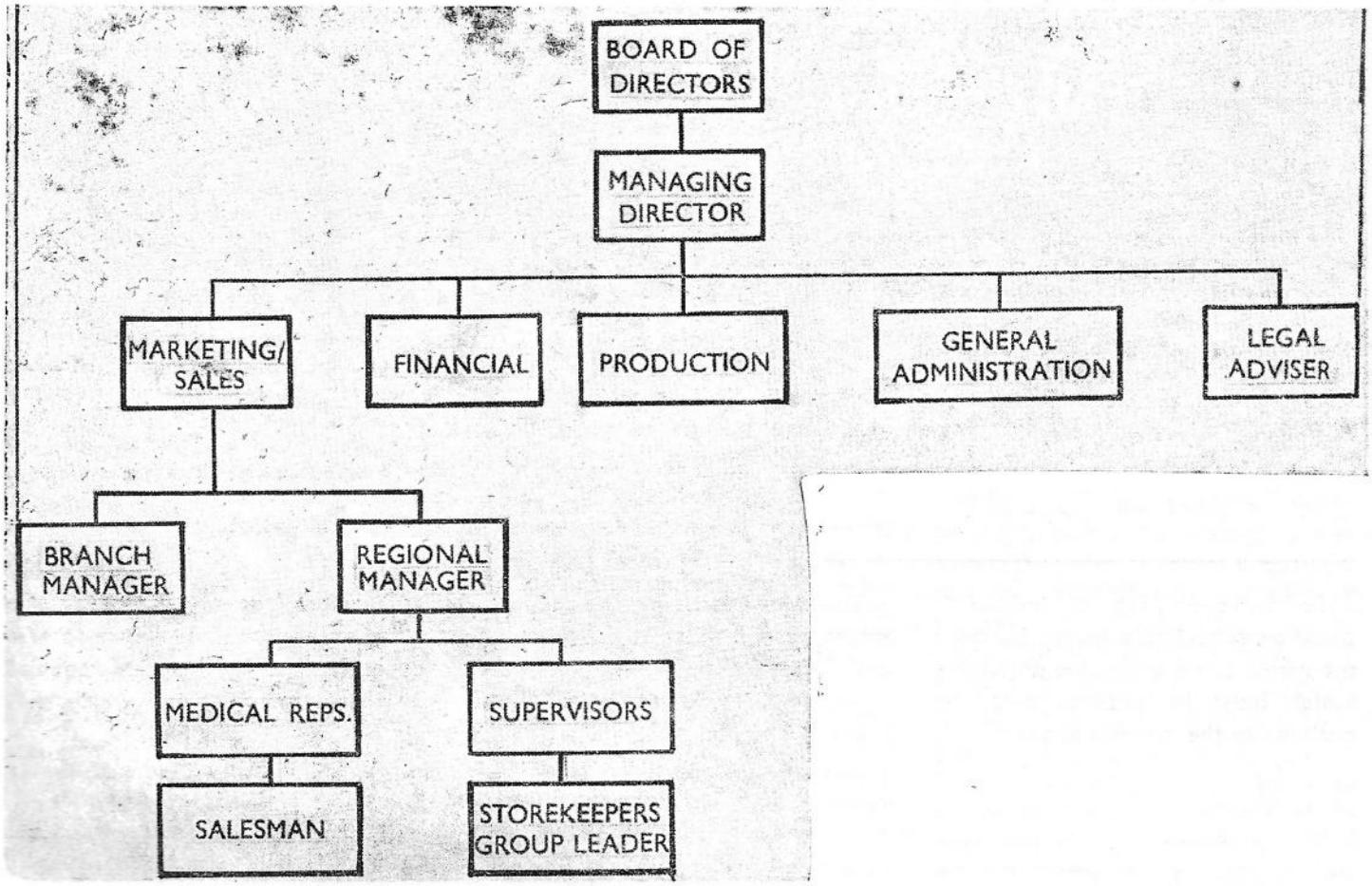
If the functions are universal, then they can be transferred from one organisation to another. This practice will be more feasible the more pure the managerial job (that is the higher it is and the fewer the non-managerial or technical components involved in the job.) That is why retired army generals do often make excellent Chairman/Managing Directors of business organisations because the managerial skills in the top level Civilian posts are almost the same as the generals face in high level military positions.

But note that managers at low organisational levels are not easily transferable.

I don't think that the works Manager at U.S.T. could easily transfer to a works manager's position in say Kumasi Brewery. The latter needs technical, non-managerial knowledge which the works manager



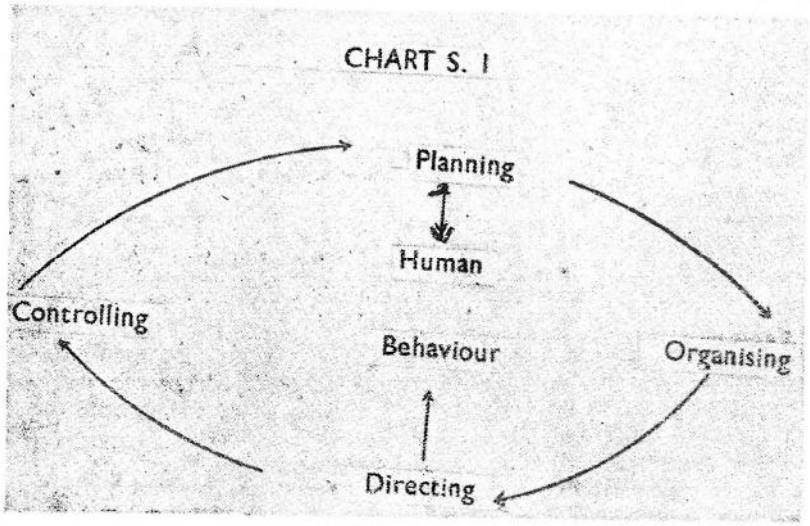
ORGANISATION CHART



at U.S.T. may not have. Yet the Head of the Faculty of Pharmacy, U.S.T., or the Head of a Ministry or Government Department could assume the role of the head of an industrial or commercial firm as the managerial function are the same in all organisations.

Sequential Performance of Managerial Functions

Though Managers perform their functions in the sequence in which they have been outlined, that is to say—planning, organising, directing or actuating and controlling, as shown in Chart S I, it is possible that in the typical work day of a manager, he would be performing all four functions, maybe several times a day. This can happen if the manager or the organisation is involved in programmes at various stages of completion. For some activities he would be planning, for others, he would be directing and others he would be controlling.

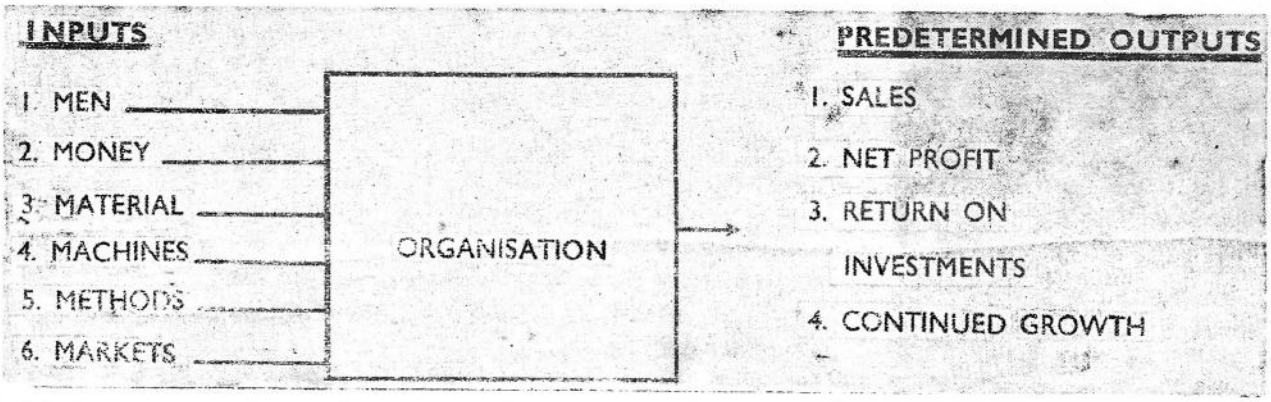


Iterative Nature of Managerial Functions

Managerial functions can be iterative, that is to say, they are contained within each other. For example, planning, organising, directing and controlling all occur in the planning, process. Similarly in organising the other functions, directing, planning, etc., would be needed.

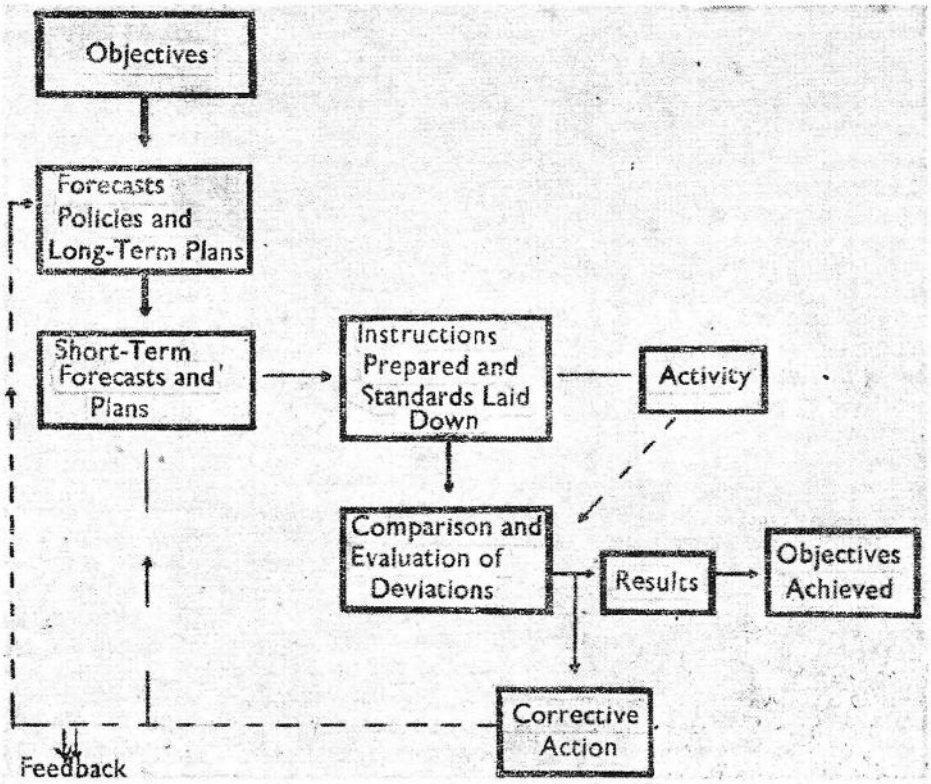
Even in planning, we can have a subprocess of planning. The iterative nature of management functions shows the dynamism involved in the managerial role.

Management is therefore the forecasting, planning, organising, executing, co-ordinating and evaluating a *Series of Inputs* to obtain *Predetermined outputs.*



To be successful an industrial, social or a charitable enterprise must set realistic and attainable objectives which must be predetermined as outlined in the diagram above.

To realise or achieve the predetermined outputs (results), it is important that Management plan, organise, execute (direct), co-ordinate and control the inputs going into the enterprise. The purpose of business or an enterprise is therefore to produce goods and/or services required by the Community and which they are prepared to pay for.



It is essential that Management defines in very clear terms the objective of a business or a unit and what goal has been set for a department to achieve. Policies must therefore be determined which are the principles to guide actions of management.

It is interesting to note that the policy making body is the Administration and the body that carries out the policies is the Management.

Management therefore involves two complimentary activities, namely:

1. Setting up the framework within which the goal will be achieved. Setting the framework involves four processes: Planning, Organising, directing, Co-ordinating and Control.
2. Making the necessary decisions that will enable the activities within the framework to move towards the goal.

Management can be said to be a three-stage process consisting of policy making, supervision and techniques. In the business enterprise, scientists and engineers tend to think of management in its supervisory aspect only and are loath to recognise its wider significance. This attitude is to be found in almost all large organisations.

Although the manager of today has to be conversant with an increasing number of useful things (techniques), knowledge of these techniques is not sufficient in itself. Professor R. W. Revans of Manchester University has said that: "Management is something more than an understanding of a large number of useful things. It is a profession distinct from the technologies, and in a sense more difficult. The manager comes first and the technologist afterwards; the manager decides what to do and the technologist provides the materials and the tools to do it; the manager poses the questions and the technologist answers them."

In this life, it is easier to answer questions than to ask them, to ask not just any questions, but the right ones. And the Manager has to ask the right questions all the time in the day-to-day execution of his job. In modern business world today, many specialists are being converted from engineering, science, finance, pharmacy etc., into general management.

Originally, competence was measured by his specialised knowledge, but as a newly appointed manager—it will be assessed upon his managerial ability—his success in getting other people to do things effectively and efficiently. It is not enough to put a brilliant specialist into the field of management, presupposing that his natural abilities will turn him into a good manager as he was an engineer, for instance. Men have to be taught that management ultimately entails policy-making as well as supervision and the use of techniques. We hear repeatedly of instances of brilliant engineers and scientists become disastrous managers on promotion.

ORGANISATION

Organisation is a *mechanism* of management. An organisation is a formalised human grouping through which management meets its objectives.

Organisation as an activity embraces the duties of designing the departments and personnel that are to carry out the work, defining their functions and specifying the relations that are to exist between departments and individuals.

Whenever organisation takes place in the context of our modern life, *three* tasks must be performed. These three tasks which have almost a universal application are:

1. division of labour
2. identification of the source of authority
3. establishment of relationships.

Division of Labour: A division of the total effort of the group-members in purposeful work contributes to the attainment of the objective. By this means the work of the group-members is not duplicated.

Source of Authority: While contributing their efforts to the achievement of the goal of the organisation, the individual members of the group must be made to comply with some source of authority. Whether this power or authority is based on instinct, culture, tradition or consent or intelligence or what have you, it is necessary. For in the absence of a directing authority, individuals may do what they want. And the result might be a non-integrated effort.

Relationship—How are the individuals in the group to work together in the organised group? If a critical decision must be made and two individuals not in an authority relationship to another are working together, who makes the decision? If individuals in different units, at different authority levels must establish contact and work together, what channels should be used? To answer these questions, the form of relationships between individuals and groups working together in the organisation must be known.

Management Organisation

We have said that organisation as an activity has three basic elements. In performing each of these tasks the manager has to do the following:

(*a*) *Identification and grouping of work*

(*i*) manager must identify the work required to be done before he attains his objective.

(*ii*) work must be broken down enough to be performed by individuals

(*iii*) jobs must be assigned in such a way that they fit into the pattern of education, training and experience of the workers in the organisation. And as he tries to unify the work done by individuals, the manager should make up teams of individuals, each doing the same kind of work or closely related work.

(*b*) Under *authority and responsibility* the manager should see to it that each individual knows exactly what work he is to do and what rights and powers he may exercise in doing it. That is to say, the limits of his powers must be clearly stated. For instance, can he hire people—what kind, and can he fire them. In delegating, the manager will decide what part of his work he will perform himself and what he will entrust to his subordinates.

(*c*) *Relationships*

The manager must set up certain rules for team work to enable his people to work harmoniously together under all possible circumstances. Such relationships can be allowed to develop fortuitously, in which event they will be as various and changeable as the personalities involved. Or they can be established on a permanent and continuing basis, so that they will form a pattern to which people can be trained and developed.

The Importance of Sound Organisation

A sound organisation can contribute to the continued success of an enterprise. But a sound organisation does not consist merely in drawing up symmetrical organisational charts. For as Louisburg Fish has said in his treaties on Organisation Planning:

Organisation is more than a chart, it is the mechanism through which management directs, co-ordinates and controls the business. It is indeed the foundation of management. If the organisation is ill-designed, if it is merely a make-shift arrangement then management is rendered difficult and ineffective. If on the other hand, it is logical, clear-cut and stream-lined to meet present-day requirements, then the first requisite of sound management has been achieved. If an organisation is properly designed and balanced it facilitates both management and operation of the enterprise. If this is neglected this will discourage and preclude effective administration. If an organisation is poorly structured, important work may be over-looked entirely or downgraded. Overload which may stem from poor organisation may directly affect operating efficiencies.

Through poor organisation, the head may be so over-burdened or overwhelmed with decisions or routine matters and operating details that he cannot have the time nor the strength to do an adequate job of planning. The workload may be so heavy that it may prove fatal.

Sound organisation facilitates delegation. A planned organisation relieves a manager from doing routine jobs which his subordinates can do. By proper division of labour, consistent delegation, clear-cut job description, the organisation structure siphons off routine duties and makes them the responsibility of lesser officers.

Sound organisation stimulates creative thinking and initiative by providing well-defined areas of work with broad latitude for the development of new and improved ways of doing things.

Conclusion

Since it has been stated above that the policy-making body is the administration and the body that carries out the policies is the Management, and also the theory that the Manager comes first and the technologists afterwards because Manager decides what to do, it is advisable that our young colleagues take Management Training and development seriously after leaving the University.

SOCIETY NEWS

FROM THE HON. GENERAL SECRETARY'S DESK

I am reviving this column in order to make available to members a record of important events that have taken place in-between the publication of different issues of the Journal. The column will also from time to time throw out some ideas on ways of improving our Society which will require comments from members. From such comments and contributions, I hope, more participation in the activities of the Society by its members will start.

As a start, I shall cover major events from January 1976 to March, 1976.

2nd March, 1976 — *Standing Executive Committee Meeting*

1. *Victor Aidoo vrs the Society:* Members will be surprised to learn that this case is still in court, despite what appeared as a settlement during the 33rd Biennial Conference at the Kwame Nkrumah Conference Centre. An arbitration Committee is however, taking action on settlement.
2. Hon. General Secretary, Dr S. O. Larbi, informed members about his resignation in April 1976 to take up a job in Kumasi.

I look forward to covering more events in the next issue of the Journal. Meanwhile, please send in more articles or even letters, pay your retention fees and building fund. We look forward to seeing you at the General Meeting in Kumasi in August.

Topic To Think About: How can we improve the outlook of Pharmacy shops in Ghana?

Please send your comments to the Editor.

H. K. ABUTIATE
HON. GENERAL SECRETARY

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