



THE GHANA PHARMACEUTICAL JOURNAL

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Volume 10 Nos 1, 2

June 1987

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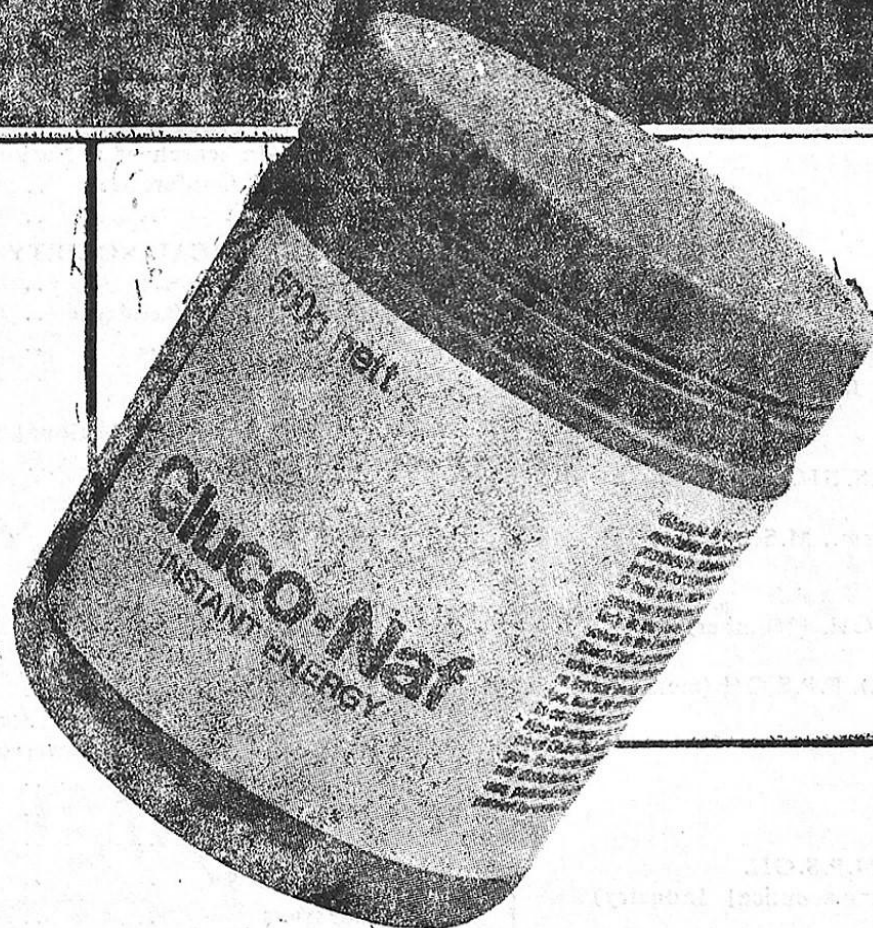
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Editorial

In Search of a National Headquarters

TWENTY-ONE years ago, members of the Pharmaceutical Society conceived a great idea—to acquire a plot of land on which to construct their national headquarters.

Since then, perhaps the most significant achievement made by the society in this direction is the identification, during the early part of this year, of plot No. B45/1 situated between Concrete Products and Terrazzo Works and Japan Motors Ltd. at the Industrial Area in Accra and the C2million down payment made to the owners of the plot, Aliceko Garment and Knitters Ltd., in a bid to purchase the plot.

The property has been valued at C10.5 million. This, by all standards, is a good bargain considering the site of the plot—by a highly potential commercial street—and the fact that the foundation for a three-storey building and reinforced concrete pillars for the first floor have already been constructed. Also the ground floor of the completed building could be rented out to prospective store owners while the upper floor, for offices and other services. Such an enterprise should by all means be a grand source of income for the Society for many years after its realization.

So, it is understandable why the balance of C8.5 million has to be paid and before November 1, this year!

Now, how do we go about realizing this sum?

It is very likely that the National Council will call for the establishment of a limited liability company to be known as PHARMAGOLD Co. Ltd. whose shareholders shall be the Pharmaceutical Society of Ghana (with majority shares), all pharmacists and pharmaceutical companies. It is envisaged that the cost of a share shall be C20,000.00 and buyers shall be permitted to purchase multiples thereof.

The Ghana Pharmaceutical Journal (G.P.J.) would like to take the lead and urge pharmacists and pharmaceutical companies to respond positively and strongly should a call by Council be made for shares to be bought since it is revenue to be obtained from this which would be used to pay the balance of the cost of the property.

It is on record that the Society once had a golden chance to possess a viable venture in the form of a printing press but failed to grab it. Today, even those who opposed the idea are biting their fingers.

By God's grace, we have in our hands yet another opportunity. We must hold fast to it—by this, we simply mean that the Society MUST purchase the plot.

So, you will have to procure a share.

The Nairobi Conference

by Joyce Addo-Atuah (Mrs)

THE main theme of the Nairobi or Fourth Commonwealth Pharmaceutical Association Conference was based on the "SPIRIT OF NAIROBI" formulated in Nairobi in

November 1985 by WHO Conference of Experts on the Rational use of Drugs.

The conference was well attended by over two hundred (200) delegates

from about thirty-one (31) member countries.

It was officially opened on Monday 9th March by the Kenyan Minister of Health, Mr Nyakiamo. Messages

were also received from the President of CPA, Dr J. N. Banerjee; the Chairman of the conference organising committee, Mr K.S. Amin; the Chairman of the Pharmaceutical Society of Kenya, Mr Mtana Lewa, and from Miss Margaret Cone, representing the International Federation of Pharmaceutical Manufacturers' Association (IFPMA). After the inauguration, a Pharmaceutical and Technical Exhibition was declared open by the Health Minister and it ran throughout the conference until Thursday, March 12, 1987.

Business started in earnest in the afternoon on the subject matter "Policies for the Acquisition of Essential Drugs", which was chaired by Dr Banerjee. Speakers for this were Prof. K Thairu of the Commonwealth Secretariat, Dr Raditapole of the Lesotho Dispensary Association and Miss Agatha Wehrli, the pharmaceutical officer of WHO. Miss Wehrli, highlighted her organisation's role in this field. The WHO Action Programme on Essential Drugs and Vaccines which was launched in 1981, has since then helped more than eighty (80) developing countries to draw up their own essential drugs lists or started projects in support of primary healthcare, providing reliable essential drugs and vaccines; which among other things:

1. Meet people's common health needs
2. Have significant therapeutic value
3. Are acceptably safe, and
4. Offer satisfactory value for money.

Political Backing

The other two speakers emphasised on the importance of political or governmental backing in providing the necessary health care infrastructure, including the organisation and management of medical stores. Something worthy of mention here is the Ration Kit System of drug distribution as practised for example in Botswana.

Here drugs needed by each district or area are packed at the central medical stores based on disease patterns, population, age distribution, etc.

The Tuesday morning session was

on "GOOD MANUFACTURING PRACTICE AND QUALITY ASSURANCE IN DEVELOPING COUNTRIES." Speakers were Mr J. Sharp of DHSS, Prof. A.H. Beckett of the U.K. and Mr. J.Y. Binka of the Gambia. All three speakers were of the opinion that there are essentially no separate sets of GMP for developing as against developed countries. Basically, all drugs whether they are produced, should be taken through the same principles of GMP and Quality Assurance, the only difference being probably the extent or details of the requirements, and the sophistication of the equipment used.

Storage

Mr Binka specifically stressed on drug storage, especially in tropical developing countries, as a major factor in assuring continuous drug quality because of extremes of temperature and humidity conditions. The structure and organisation of medical stores play a very important role here. Significant contributions from the floor included the recent increases in the appearance of shoddy finished products and raw materials in many developing countries, where because of lack of the necessary equipment or personnel, may not be able to detect the fraud and the danger to their peoples; the use of expired drugs and the need for developing countries to make provision in their annual health budgets for simple quality control equipment like the T.L.C. etc.

The afternoon session tackled "PRODUCT REGISTRATION IN DEVELOPING COUNTRIES" with Miss M. Cone of IFPMA, Mrs S. S. Tessema of the Kenyan Ministry of Health and Dr P. O. Emafo, the Director of Pharmaceutical Services of Nigeria, speaking on the topic. All speakers agreed that the importance of product registration is to limit the number and the types of drugs used in a given country or area. This is especially essential in developing countries which often serve as waste bags for all sorts of questionable products from the so-called developed and developing countries.

The WHO Expert Committee on specification for pharmaceuti-

cal preparations publications could be helpful to countries now beginning to set up drug Registration Boards.

Facilities needed were enumerated as trained personnel, facilities for record keeping which could be computerised to minimise space requirement, equipment for quality assurance etc.

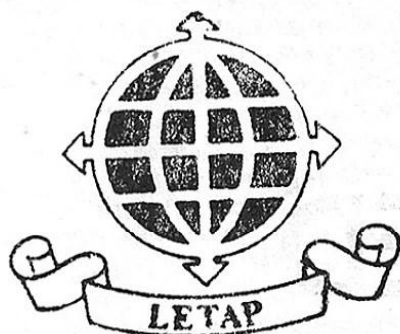
What came to light was the non-availability of such Drug Registration Boards in many developing countries which therefore render themselves easy prey for the dumping of all sorts of shoddy and suspicious drugs on their markets. The Pharmacy Board of Ghana was worthily mentioned.

The topic "DRUG ABUSE" is always popular in medical and pharmaceutical circles and it took the whole of Wednesday 11th March, under the Chairmanship of Prof. D'Arcy of Northern Ireland. Speakers were Prof. D'Arcy, Prof. Beckett and Prof. Acuba of Nairobi University.

Prof. D'Arcy spoke on the abuse of narcotics in general, Prof. Beckett on the abuse of drugs other than narcotics eg. anabolic steroids etc. by sportsmen, dwelling on his experiences as a member of the International Olympic Committee on Narcotics. He said simple tests have been developed to detect the minutest traces of these drugs or their metabolites taken by sportsmen prior to international competitions. Prof. Acuba enlightened delegates on the use and dangers of a local narcotic plant used by natives of East Africa.

Image

The Thursday session was on "FAMILY HEALTH CARE AND PUBLIC RELATIONS." Mrs Pauline Ong, the General Manageress of the largest chain of retail pharmacies in Singapore, impressed everyone present by her professionalism in the midst of brisk business. Mr Tim Astill, Director of the National Pharmaceutical Association of Great Britain (equivalence of the Pharmaceutical Cooperatives in Ghana) gave a preview of the efforts the NPA has made to enhance the image of the pharmacist in the eye of the British Public. This has been achieved by intense



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advertisement on TV and other News media, public lectures and a greater involvement of pharmacists in community based projects eg. community health care etc.

Dr Dominique Karanja of Kenya was of the opinion that all the problems of the pharmacist in developing countries would be solved if he also assumed the title "Dr" like his counterpart in the medical profession, but this was not favourably received by delegates present.

A very impressive presentation of the importance of Family planning in developing countries was given by Mr Pearce-Biney of Ghana. He highlighted the benefits to governments and their peoples if the programme is adopted, basing this on the work being done in Ghana by the Social Marketing Programme in conjunction with Pharmahealth Company Limited and the Ministry of Health.

Delegates were also educated on the symptoms of some common ailments which according to Mr. J. Bell of Australia, the community pharmacist should be able to discern and treat in an effort to enhance both his professional image as well as boost up his business.

Working groups each comprising of a small number of invited experts were asked to dwell on the topics "Policies for the Acquisition of Essential Drugs", "Good Manufacturing Practice and Quality Ass-

urance" and "Product Registration". On Friday morning, the conveners of these working groups presented to the conference for discussion and approval, models on these areas for use in developing countries.

The closing session of the conference followed immediately after this with an open forum where delegates were invited to make open any opinion, observation, suggestion etc. for the proper functioning of the CPA and the organisation of future conferences. The outgoing president, Dr J.N. Banerjee of India then formally introduced the newly elected officers and regional representatives of CPA to the general conference. He then handed over the reigns of the presidential office officially to the President-elect, Mr A.O. Scales of Canada.

THE SOCIAL PROGRAMME OF THE CONFERENCE

The social programme was no less exhaustive than the business sessions, thanks to the ingenuity of the organisers. It started off with a welcoming cocktail reception for delegates at the luxurious Inter-Continental Hotel in Nairobi on Sunday 8th March.

This afforded delegates the opportunity to get to know each other informally before the official opening of the conference the following day.

On Monday evening, there was an entertainment of cultural display at the Bomas of Kenya about 8 km outside Nairobi, followed by a sumptuous dinner.

Then came the mid-week banquet at the Carnivore—an extra-ordinary restaurant outside Nairobi which specialises in barbecues of all sorts of game and meat in an exclusively African setting.

The climax of it all was the Grand Banquet and Dance on Saturday evening again at the Hotel Inter-Continental.

Departure for most delegates was on Sunday 15th March, although some stayed on in Nairobi for the post-conference Safari Tours.

All in all, the 4th CPA Conference was a big success and it was agreed by all who had attended the previous ones, that the Nairobi conference turned out to be the most fulfilling, professionally as well as socially.

We have to congratulate the organisers, especially the hosts—the pharmaceutical society of Kenya—for a work well done.

I hope you are all preparing towards the Bahamas Conference in 1992!

LETTERS to the Editor

"Wrong" Jokes

Dear Sir,

I do very much appreciate the efforts the Editorial Committee is making to put "life" in the Journal but there is one thing which, in my opinion, is not contributing positively to the publication of a serious magazine like the Ghana Pharmaceutical Journal.

This is the type of jokes that appear in the Journal.

One would expect that jokes appearing in the Journal would exhibit some scientific character and not sound so loose like the first joke in the last edition (Vol. 9, No.2)

of the Journal.

I also feel the said edition contained too many jokes.

Charles Oduro
Ashanti-Mampong

* * *

United We Stand

Sir,

Permit me to air my views on the current impasse between the Executive of the Government and

Hospital Pharmacists Association (GHOSPA) and the present leadership of the Pharmaceutical Society of Ghana.

Before I go any further, I would like to drive home the fact that the Pharmaceutical Society of Ghana (P.S.GH.) is the only body with the requisite statutory powers to negotiate with government or any other organized body on behalf of all Ghanaian Pharmacists on all matters affecting pharmacists and any aspect of pharmacy practice.

It follows therefore that all wings and branches of the society are wholly accountable to the National

Council and as such all laws and Bye-laws of the Society and any pronouncements emanating from the National Council are binding on all wings and branches, as well as taking precedence over any Bye-laws of any wing of the society.

What I am stressing here is the fact that the National Council of the Pharmaceutical Society of Ghana is there not for any interest group or wing of the society, a misconception currently being strongly held by the membership of GHOSPA.

At the last general meeting of GHOSPA held at the Komfo Anokye Hospital in Kumasi in March this year, which I attended as a member of GHOSPA representing the Police Hospital, there were quite a number of individual enquiries like "What has the National Council done for Hospital Pharmacists?" "Medical officers in the country had their latest salary adjustments due to pressure put on the government by the Ghana Medical Association, what has our council done in this connection?" "Is it not a fact that the council is there for the General Practice Pharmacists?"

What I want to find out is, has minutes of any GHOSPA meeting ever been sent to the National Council for deliberation and implementation where necessary? I am yet to come across any memorandum having been received by

the secretariat of the Society from GHOSPA asking for support in reaching a more favourable conditions of service with their employers.

I remember at the said Kumasi meeting, I took the opportunity during a vote of thanks I was asked to give to appeal to the executive of GHOSPA to send copies of minutes and important proposals arrived at, to the National Council for the necessary action to be taken but regrettably, as at the time of writing, no such receipts have been made by the Council. Where then lies the justification for accusing the National Council of sectional interest, or of inertia and lack of interest where the welfare of Hospital Pharmacists is concerned?

Colleagues, I wish to humbly use the columns of this esteemed journal to appeal to you all not to limit your loyalty solely to your present wing or branch but to stretch it to cover the National Society, for though you find yourself under the umbrella of a particular wing or branch today, you may be under another tomorrow.

Let us put all personal differences aside and unite to form a strong and healthy National Society to which we would all feel proud to belong, and one which would be a force to reckon with in the country.

*Joyce Addo-Atuah (Mrs)
Senior Pharmacist
Police Hospital, Accra*

* * *

Drug Samples

Dear Sir,

It is the normal practice all over the world that drug samples do not attract customs duty.

In Ghana, however, the case is different—samples attract duty just as products intended for sale.

Could the reason for this move by the Government really be because certain pharmacists in the past sold samples although they cleared these without having to pay a pesewa as is widely circulated?

Well, I find it hard to accept this as the reason, for how, for example, can Ghanaians decide not to reproduce any more simply because some babies grow up to become wayward and evil inclined?

Sampling has a useful role to play in marketing and hence in society and those who have made it their aim to undermine its use must be identified and punished, but for God's sake the principle must not be erased as has been done.

Duty, necessarily, must be waived off drug samples.

*Louis Nortey
Bascofarma,
Accra.*

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NATIONAL CONFAB

The 39th Conference

THE Secretariat of the Pharmaceutical Society of Ghana has announced that the 39th National Conference of the Society will take place at the Christ the King Hall (near the Flagstaff House) in Accra from October 22 to 25 under the theme "Towards Effective Drug Management and Utilization".

The Official Opening of the Conference as well as the opening of an exhibition which is to run through the period of the conference are expected to be performed by the PNDC Secretary for Health, Air-Commodore F. W. K. Klutse while Prof. Kwame Sarpong of the Faculty of Pharmacy, University of Science and Technology, Kumasi will deliver the Keynote Address.

A symposium on the theme of the Conference is scheduled for Friday October 23 and will be chaired by the President of the Society, Mr K.

A. Ohene-Manu. Panelists include Mr S.A. Botchwey, Deputy Director of Pharmaceutical Services; Prof. Ansa-Asamoah, Vice-Dean of the Pharmacy Faculty at UST; Dr. Daniel Ofori-Adjei, a physician at the Korle - Bu Teaching Hospital, and Mr R. S. Kwateng.

New officers will be elected at the conference to serve the Society for the next biennium. Posts to be contested for include President, Vice-President, General Secretary, Assistant General Secretary, Treasurer, Editor and two Council Members.

The Conference will be rounded off with a dinner on Saturday, October 24 at the Bukom Nite Club, Hotel Continental, Accra. During the dinner, about 60 newly qualified pharmacists will be inducted while four distinguished pharmacists will be made fellows of the Society.

GREATER - ACCRA

Interim Account Rendered

WITH half of their term in office spent, the executive of the Greater-Accra Branch of the Society has given "an interim account" of their stewardship on March 19.

In a short opening address, the Chairman of the Branch, Mr. Akiwumi said the motive for their action was that they believed "any executive that does not encourage or tolerate criticism always has something to hide or its ill-conscience is dictating negatively to it".

Touching on the present high level of attendance and lively debates during meetings, the Chairman noted that "the apathy which members of the Branch showed previously at meetings and other functions was not deliberate and that there was no proper directives to stimulate interest".

Mr. Akiwumi promised his

audience that if the Ashanti Branch was "good", then the Greater-Accra Branch, under his leadership, would be "better".

Presenting the Financial Report, Mrs. Esther Amedzro, (Treasurer) told members that although they inherited a sum of only C36,064.55 the accounts of the Branch now show an excess of income over expenditure to the tune of C144,345.00.

She regretted, however, that "out of the over 30 pharmacists working in various government hospital pharmacies in the region in 1986, only 6 had fulfilled their financial obligations."

Mrs. Amedzro urged "those pharmacists who have been very apathetic during the past year to show some interest in the affairs of the Society this year."

GREATER - ACCRA

Checks at KIA

THE Pharmacy Board is taking steps to check the influx of shoddy medicinal products into the country.

Mr. T.C. Corquaye (Registrar of the Pharmacy Board) has announced at the Greater-Accra Branch meeting which took place in January.

According to Mr. Corquaye, inspectors from the Board now make regular trips to the Kotoka International Airport (K.I.A.) - the main entry point for such products - to ensure that MINISTRY OF HEALTH permits submitted by importers going through Customs formalities conform with products imported.

The exercise is being carried out in conjunction with Customs officials who hitherto have been performing this duty alone.

Also, once in a while, samples are tested at the Ghana Standard Board (G.S.B.) for quality assurance.

Imported products for which no proper permits are submitted or are proved to be of poor quality are confiscated.

The Registrar warned that signatories to permits for pharmaceuticals that are found, after testing, to be sub-standard will be held responsible and therefore appealed to all pharmacists to help in the exercise.

GREATER - ACCRA

Danafco's Offer

DANAFCO Ltd., one of the leading pharmaceutical manufacturing companies in the country has in a letter to the Pharmaceutical Society of Ghana expressed its intention to sponsor all adverts for the Society's meetings and programmes.

The Company has also undertaken to do the same for the other societies comprising the Health Care Delivery Team.

Essential Drug Lists & National Drug Formularies

THE 6th General Assembly and 18th Council Meeting of the West African Pharmaceutical Federation (WAPF) held in the Gambia under the theme "Drug Management and Control" has welcomed the introduction of Essential Drug Lists and National Drug Formularies by the various governments of the West African Health Community (WAHC).

The Conference which took place at the Fajara Hotel, Banjul, from May 3 to 9 and attended by delegates from the Gambia, Ghana, Liberia, Nigeria and Sierra Leone, agreed that the introduction was "an appropriate measure to eliminate ineffective, harmful and over-priced drugs as well as in some cases eliminate the use of irrational combination products and promote cost-effective purchasing policy."

On the promotion of rational use of drugs, the Assembly endorsed the need for relevant drug information at all levels of health care. Such information which should be easily comprehensible should also be objective and compare the value of new medicines with similar existing preparations with respect to indications, contra-indications, adverse reactions and long term effects.

The Assembly emphasized the need to update and enforce existing drug laws and regulations by governments in the Sub-region especially those concerning registration of manufacturing and distribution premises. Regular inspection of these premises should be carried out in order to ensure the production of good quality products and high standards of practice and to effectively check the manufacture and distribution of fake and sub-standard products.

Grave concern over the increase in the abuse of Psychoactive drugs in the Sub-region arising largely from our various countries being used as transit points for the illicit trafficking of such drugs was

expressed. The Assembly requested governments of member states, as a matter of urgency, to institute measures to arrest this phenomenon noting that this would require a multi-disciplinary approach and co-operation among member countries in the Sub-region.

In view of the infrastructural constraints to quality assurance of imported products into the Sub-region, the Conference resolved that the various governments should encourage and enforce local production of drugs within the limits of available technology and trained personnel.

This policy, it added, would ensure the manufacture only of products which were relevant to health care needs of states within the Federation. The Assembly was of the opinion that products for whose manufacture appropriate local technology existed should not be imported and that governments of the Sub-region should show commitment to local production by encouraging a purchasing policy which would stimulate and promote domestic production.

In order to improve upon and ensure proper drug management in the Sub-region, the Conference recommended that pharmacists, who were experts in this area, should be involved in the highest policy making bodies in health institutions of the Sub-region.

While expressing an appreciation

of the economic problems facing the Sub-region and the resulting decline in national incomes, the Assembly urged the various governments to increase funds allocated to the health sector if medium and long-term objectives of developing healthy human resources was to be realized.

With regards to "the poor economic condition of most of our people in the Sub-region who are consequently lacking access to essential drugs", the Assembly urged "pharmacy practitioners to ensure optimum utilization of their resources, develop better knowledge of purchasing, budget controls, inventory management, supply and distribution of drugs and medicinal products in order to provide pharmaceutical services most economically".

Towards the improvement of the standard of health care delivery in the Sub-region, the following were proposed:

- (a) a clear political co-operation among the countries of the Sub-region;
- (b) a provision of effective primary and secondary health care for all within the WAPF zone; and
- (c) an increase in the level of literacy as well as an improvement in the quality of education of the peoples of the Sub-region.

New Officers for W. A. P. F.

MR. T. Manly - Rollings of the Gambia was elected President of the West African Pharmaceutical Federation (WAPF) at the 6th General Assembly of the Federation.

Mr. Manly-Rollings and the following officers will run the affairs of the Federation for the

next biennium: Prof. P. Iwe Akubue (Nigeria), 1st Vice-President; Mr. T. C. Corquaye (Ghana), 2nd Vice-President; Mr. Abioye Oyetunji (Nigeria), Secretary-General; Mr. M. M. Sesaj (Sierra-Leone), Asst. Secretary-General; Mr. Nathaniel Cassel (Liberia), Treasurer; and Capt. M. Leadi Cole (Sierra Leone), Editor-In-Chief.



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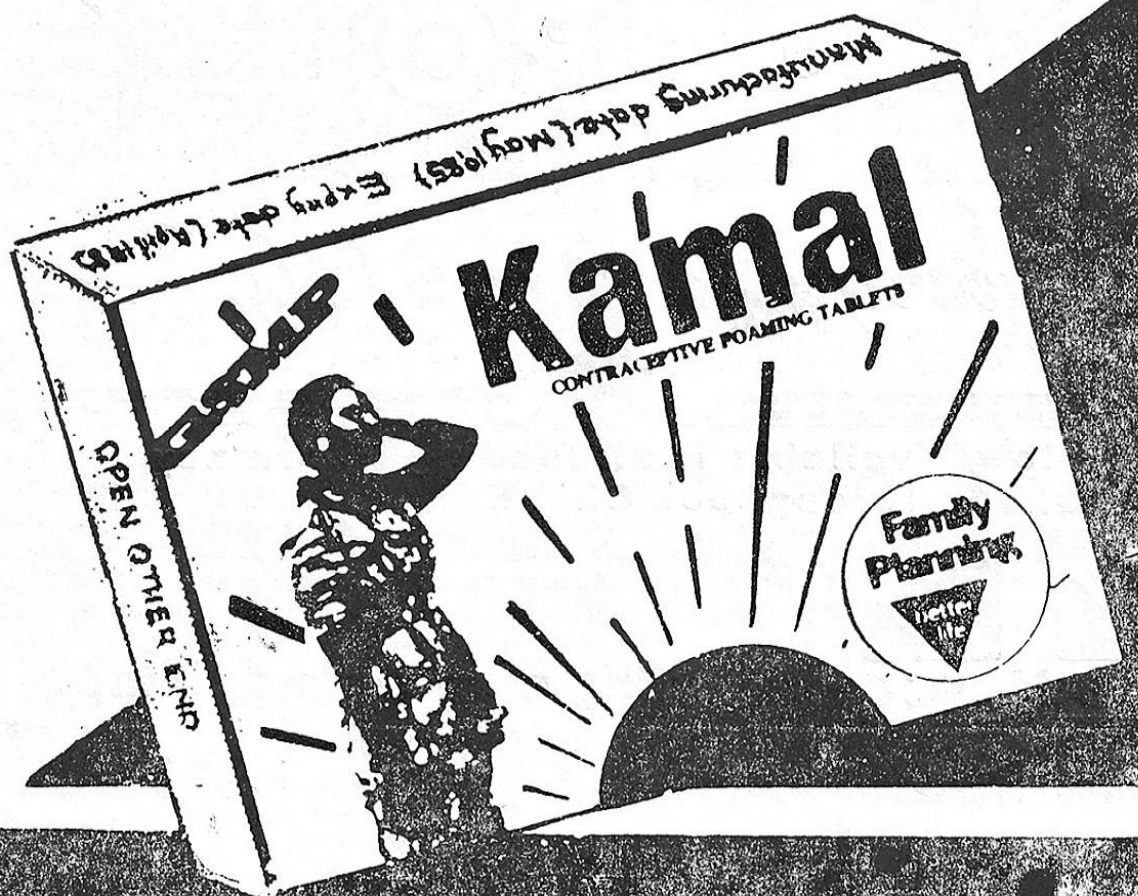
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NAIROBI**Commonwealth Pharmacists Meet**

THE Fourth Commonwealth Pharmaceutical Association Conference has been held in Nairobi, Kenya from March 7-14, 1987.

Prof. Kwame Sarpong, Deputy Vice-Dean and Head of the Pharmacognosy Department at the Faculty of Pharmacy represented Ghana at the CPA Council meeting which took place during the conference. Thirty-one member countries were represented at this meeting which admitted Belize and Cyprus into full membership.

The poor financial position of the Association was noted and it was agreed that the subscriptions for member associations as well as for personal membership could be paid into an account in that member country where there was a genuine difficulty in transmitting the subscriptions because of foreign

exchange restrictions.

The meeting was notified of priority problems that had been submitted to the Secretariat by some member Associations. These are small scale projects which could be funded by the Commonwealth Secretariat. Ghana is yet to identify a project and propose it to the CPA.

It also came to light that the CPA has now established working relations with the world Health Organisation (WHO), Federation International Pharmaceutique (FIP), International Development Assistance Committee, Australia, and the British Government's Overseas Development Agency.

On CPA activities during the next five years the following matters among others, were brought to the attention of Council:

- i. Education and training requirements of pharmacists and Pharmacy technicians.
- ii. The establishment of an international centre for the collating and distribution to member countries information about recent scientific developments relating to medicines.
- iii. The provision of pharmaceutical reference books and back copies of journals to certain developing countries.
- iv. The position of the pharmacist within the primary health care team and within all policy discussions related to medicines.

THE BAHAMAS**Scene for Next Confab**

THE fifth C.P.A. conference is scheduled to take place in the Bahamas in 1992, although it was the general feeling of the Nairobi Conference that intervals between conferences are reduced to allow for greater membership interaction.

It would interest members to know that the conference is held

every five years and can be hosted by any member country.

The first three were held in Australia, India and Trinidad and Tobago in that order after its constitution had been drawn up in London in 1969.

Council has fixed an Executive Committee Meeting in Malta in August 1989.

He replaces Dr J. N. Banerjee of India and will be at the helm of the Association until 1992.

Mr D. M. C. Major of the Bahamas and Prof. A. N. Beckett of Great Britain were elected 1st and 2nd Vice-Presidents respectively.

Council appointed Mr Raymond Dickinson as Secretary/Treasurer.

ELECTIONS**The New Leaders**

CANADA'S A.C. Scales has been elected President at a meeting of Council held on March 11.

CELEBRATION**Pharmacy Day**

THE President of the C.P.A., Mr A.C. Scales had sent out a personal message on the celebration of Commonwealth Pharmacy Day on June 16, every year.

The message called upon member associations and societies 'to make concerted effort to advance the work of their national associations, either through an increase in the membership or perhaps by undertaking an educational project. It also asked member associations 'to convince national authorities that only pharmacist have a full appreciation of all aspects on the manufacture, control and distribution of medicines, and therefore there should be a pharmaceutical input into all discussions and policies related to medicines.'

Council has decided that the Regional Branches of the Society should draw up programmes for celebrating Commonwealth Pharmacy Day each year.

AIDS in Ghana

DR. Alfred Neequaye, Chairman of the National Technical Committee on the disease Acquired Immune Deficiency Syndrome (AIDS) has observed that the apathetic attitude of Ghanaians towards the dangers of the disease AIDS could lead to a virtual destruction of the Ghanaian Society.

He was speaking at a lecture on "AIDS—Social Aspects" in Accra on January 27.

Dr. Neequaye said 88.8% of cases reported fall within the age group of 15 and 45 years and since that age group constituted the youth, the future of the nation could be bleak if serious steps were not taken to prevent the spread of the disease.

To avert this catastrophe therefore, a foundation aimed at campaigning against the spread of

the disease was to be set up, he said.

The Chairman hoped that when the foundation was set up both government and the public would actively support it.

The first AIDS case in Ghana was reported in March last year when a couple was deported from Germany because they exhibited symptoms of the disease.

Since then, 107 cases have been detected. Out of this total, 61 came from the Eastern Region, around areas such as Koforidua, Akuse and Larteh, 22 from Greater-Accra nine from Brong-Ahafo and five each from Ashanti and Central Regions.

Three came from Western Region and two from the Volta Region. Due to logistics problem there is no data available from the Northern and Upper Regions.

Import Duty on Drugs Lowered

DUTY on all importations of medicinal products has been lowered from 30 to 20% of the Cost, Insurance and Freight (CIF) value.

This was contained in the 1987 budget presented by the P.N.D.C. Secretary for Finance and Economic Planning, Dr. Kwesi Botchway in Accra in February.

The special Levy of 10% has been waived while the 20% pre-tax payable to the Internal Revenue Service is retained.

Under item 14 of the sales Tax Amendment Act of 1980, medicinal products intended for consumption are exempted from Sales Tax.

It is however not likely that prices of medicines, especially those on the Essential Drugs List, will fall since the exchange rate for the dollar will now be determined by the weekly foreign exchange auction for all transactions within the economy.

Cost Recovery Programmes Praised

THE WAPF has, at its 6th General Assembly, commended the Cost Recovery Programmes being initiated in various health institutions within the West African Sub-Region.

The Programme, which is being introduced as a means of supplementing health care services funding and also ensuring continuous supply of essential drugs in public hospitals, involves payment of substantial fees for health services rendered in public hospitals including the supply of medicines.

In Ghana the Programmes has been in place since June, 1985 and it is envisaged that the revenue collected, which is expected, in time, to reach something like 60% of the cost of running the nation's health services, will form the basis for a revolving fund.

Since the introduction of the Programme, monthly revenue figures reported from various health institutions have been steadily increasing.

For instance, the Korle-Bu Teaching Hospital has recorded the following figures in the months in-

dicated in revenue:

January, 1986	— C1,111,830.00
February, 1986	— C1,248,766.00
March, 1986	— C1,250,762.00
January, 1987	— C2,159,414.00

Meanwhile, a National Health Insurance Scheme is being actively considered for implementation. When installed, the scheme is likely to relieve the average worker of the financial burden the Cost Recovery Programme is likely to place on him.

The weekly

Auction

THE weekly foreign exchange auction instituted by the P.N.D.C. government in February this year appears to have opened up easier avenues for financing drug purchases.

For the first three months of this year alone, the health sector received a total sum of U.S.\$6,633,849.92 whereas for the whole of 1985, for example, total foreign exchange allocation to the health sector for the purchase of medicines and other medical supplies was U.S.\$6.75.

Drugs Subsidy

THE Ministry of Health may completely remove the subsidy on drugs sold in public health institutions.

Dr. Moses Adibo, Director of Medical Service made this known in Accra on June 16.

This means that patients visiting these institutions will have to pay the full cost of drugs they obtain from pharmacy departments of government hospitals just as they would from private pharmacies.

Dr. John Ocran

THE West African Pharmaceutical Federation (WAPF) has instituted a lecture in memory of the late Dr. John Ocran who died from injuries he sustained in a motor accident last year while he was still the Executive Secretary of the Federation.

Prof. K. Boakye-Yiadom, Provice Chancellor of the University of Science and Technology (UST), delivered the 1st lecture entitled "Health for All by the Year 2000—The Fading Mirage for the Sub-Region". This was at the 6th General Assembly of the Federation held in Banjul, the Gambia from May 3-9.

Product Review

Ambilhar Tablets

MANUFACTURER: Pfizer

ACTIVE INGREDIENTS:

Niridazole 100mg, 500mg

PHARMACOLOGY: Has a pronounced effect on the vitelline cells of female schistosomes which results in an arrest of egg shell formation and disappearance of most of the contents of the worm. In higher doses it also arrests spermatogenesis in the male worms. It is well absorbed orally, rapidly metabolised in the liver and mainly excreted by the kidneys.

MAIN INDICATIONS: Treatment of schistosomiasis; amoebiasis, dracunculiasis.

CONTRAINDICATIONS: Concurrent administration of izoniazid, severe liver damage, portacaval anastomoses, patients in very poor condition, severe malnutrition, protein deficiency, advanced anaemia, history of psychotic disorders or epilepsy.

PRESENTATION: Tablets;
100mg—40, 500mg—20.

DOSAGE: *S. Japonicum*—20—25mg/kg for 5 days. *S. Mansoni*—25mg/kg daily for 7 days.

SPECIAL PRECAUTIONS:

Colours urine brown. If treatment prolonged over seven days for sound medical reasons, blood counts should be carried out regularly.

SIDE EFFECTS: Headache, anorexia, nausea and vomiting. Maculo-papular and erythematous skin rashes have also been reported. Also insomnia, nightmares and muscular tremors.

LOCAL AGENTS: Pfizer Ltd.,
P. O. Box 1610,
Accra.

CLASSIFICATION: B.

Rendezvous

GREATER ACCRA branch meetings on July 16, September 17, and November 19 at the Social Advance Institute Building.

First Clinical Pharmacy Workshop on "Asthma" and "Hypertension" at Kumasi from July 26-August 1.

The 39th Conference of the Ghana Pharmaceutical Society at Christ the King School in Accra from October 22-25.

Friday, December 18—End of Year Dance of the Greater-Accra branch at the canteen of the Social Advance Institute.

Chemotherapy and Prophylaxis of Malaria

By Frederick N. Gyang, B. Sc., Ph.D., M.P.S.GH.

Department of Biochemistry,
University of Ghana,
Legon.

IT is remarkable to think that in spite of massive efforts by the World Health Organisation and national medical research institutions to eradicate and contain malaria infection over the years this protozoan parasite still poses a major health problem in tropical countries. The vector which carries the sporozoites to humans (1), the *Anopheles* mosquito has been attacked by indoor and aerial spraying with insecticides. Logistic problems in the application of insecticides in the non-accessible areas and the resistance of the vector to the insecticides used have contributed to the failure of this line of attack.

Vaccination of humans against malaria which is a possible alternative method of malaria control has been pursued in many laboratories especially since the successful *in vitro* cultivation of the human malaria parasite, *Plasmodium falciparum*, the most prevalent and dangerous malaria parasite in the West African subregion. (2) Numerous malarial antigens of a sexual blood stages, gametes and sporozoites have been identified which show promise as potential immunogens for vaccine formulation for use against malarial infection in man and for blockage of transmission to mosquitoes. The production of enough parasite antigenic material for large scale vaccination which has been the major constraint in malaria vaccine development has been partly overcome by recombinant DNA or genetic engineering technology which has revolutionised molecular biology over the past ten years. In this technique the parasite gene that

controls the synthesis of a particular antigen is cut from the parasite deoxy-ribonucleic acid (DNA) with the use of restriction enzymes. The gene is then cloned with the aid of a carrier 'vector' and expressed in fast growing bacteria. Formulated malaria vaccine preparations are now receiving laboratory and clinical trials. There is therefore the optimism that within the not too distant future malaria vaccine will be made available for use in malaria endemic countries. The availability of a vaccine will not necessarily end the battle against malaria but rather supplement the arsenals available to man to attack the parasite.

The administration of compounds that destroy the malaria parasite has been the most tested tool for the prevention and treatment of malaria infection. The first antimalarial compound to be used was quinine from the bark of the South American tree, *Cinchona*. The plant was later cultivated in India, Ceylon (Sri Lanka) and Java. Quinine has very potent antimalarial property and was extensively employed for over two centuries but it took an additional century to synthesize (3).

The threat to the sources of supply of *Cinchona* bark during World Wars I and II saw intensive search to find synthetic drugs to replace quinine. This led to the syntheses of mepacrine and pamaquine just before World War II.

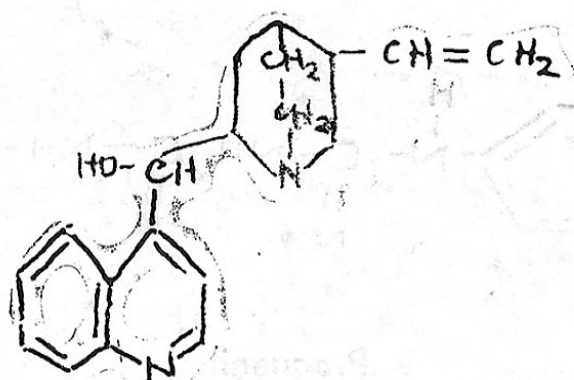
Since these two antimalarials have some toxicity to the host of the parasite, man, efforts were made to develop better drugs. These investigations culminated in the synthesis of

the folate inhibitor antimalarials proguanil and pyrimethamine and of a new 8-aminoquinoline, primaquine which is better tolerated than pamaquine, the other 8-aminoquinoline, the last two being the only known tissue schizonticidal antimalarials.

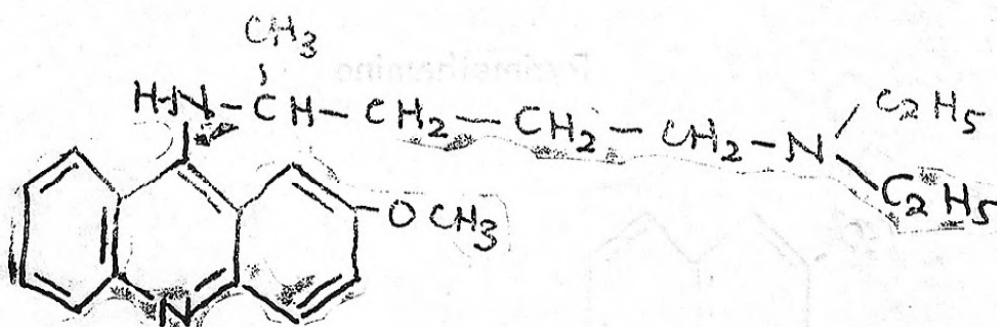
The folate inhibitors are slowly absorbed but stay in the system over a long period and are therefore good prophylactic but not therapeutic agents. They exert their effect on DNA by influencing biochemical processes that normally lead to the production of the components from which DNA is synthesized. When the parasite is deprived of these components it cannot make new DNA required for its multiplication and eventually dies.

For radical cure of *P. vivax*, *P. ovale* and *P. malaria* which contribute to a very small proportion of malarial infection in the West African subregion, primaquine is the drug of choice because of its tissue schizonticidal property. However individuals with the inborn error of metabolism, Glucose-6-phosphate dehydrogenase deficiency, develop an acute haemolytic episode following the administration of primaquine. For this reason the hereditary enzyme deficiency has been referred to as primaquine sensitivity (4). The last folate inhibitor antimalaria to be developed was trimethoprim. The folate inhibitors proguanil, pyrimethamine and trimethoprim have played a major role in antimalarial prophylaxis.

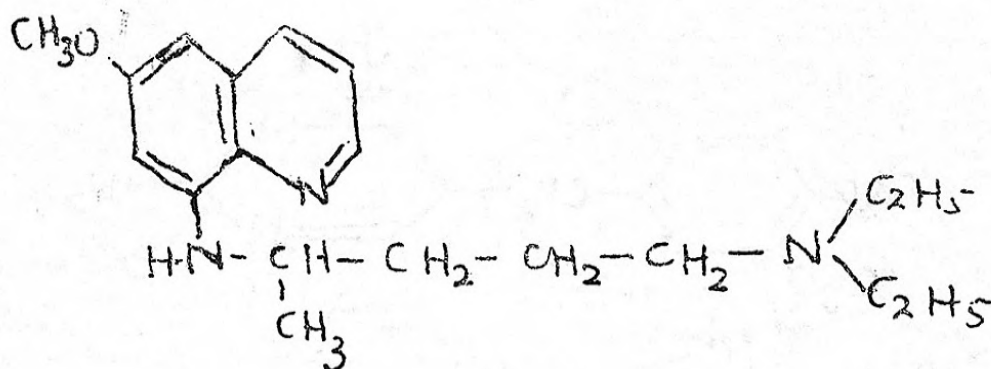
The 4-aminoquinoline, chloroquine was synthesized in 1934 by
(Continued on page 15)



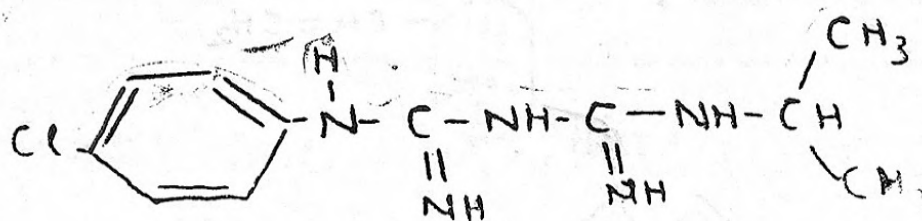
Quinine



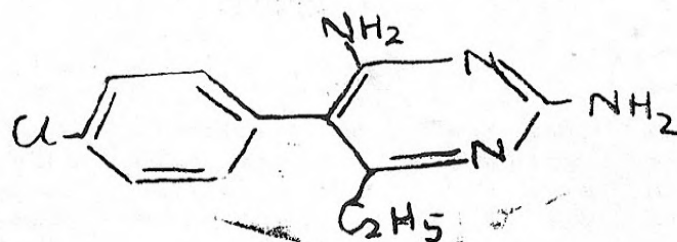
Mepacrine



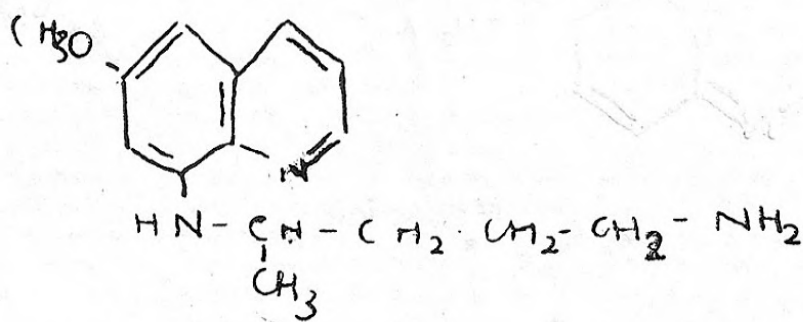
Pamaquine



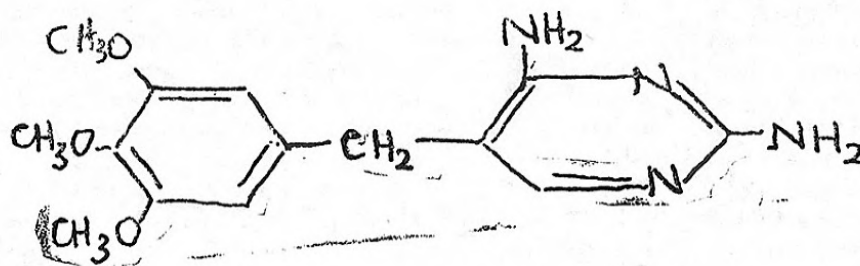
Proguanil



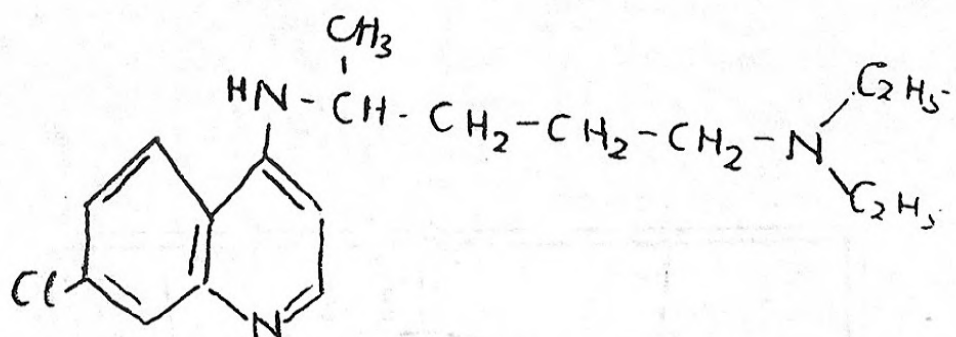
Pyrimethamine



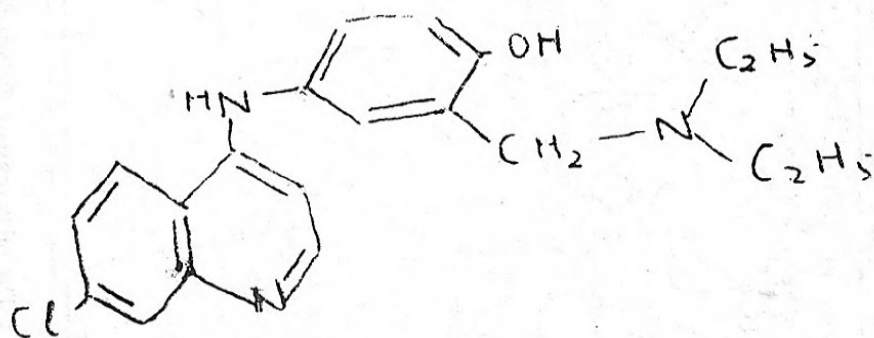
Primaquine



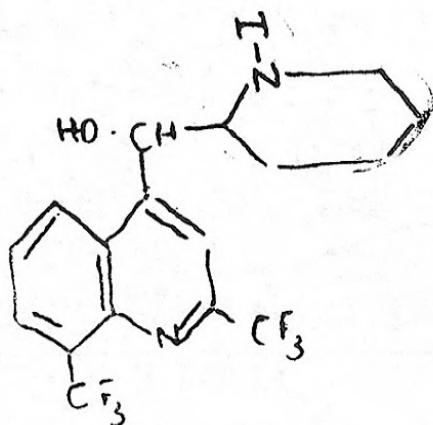
Trimethoprim



Chloroquine



Amodiaquine



Mefloquine

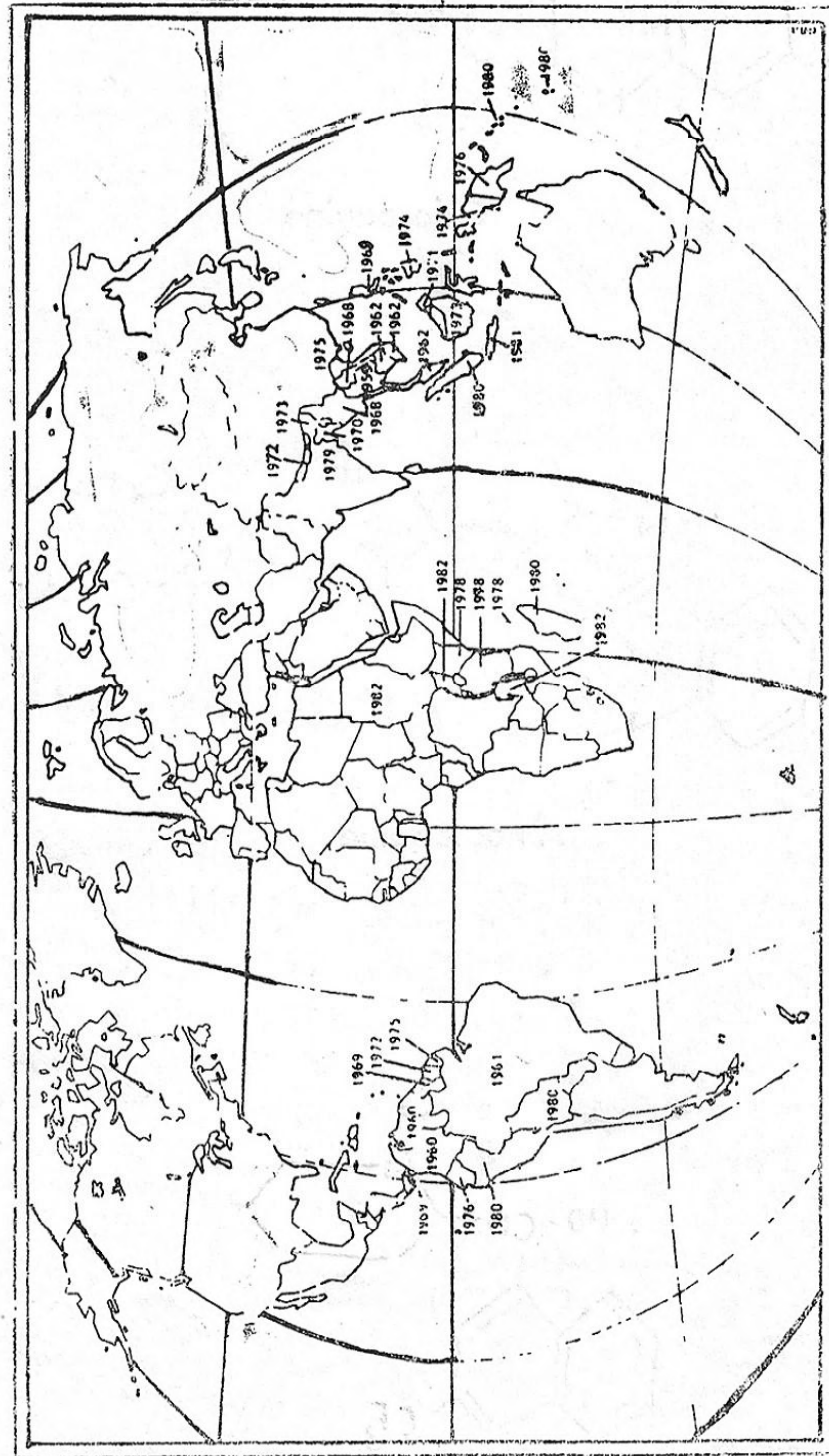


Figure Chronological sequence of the occurrence of chloroquine-resistant *Plasmodium falciparum* in the world.

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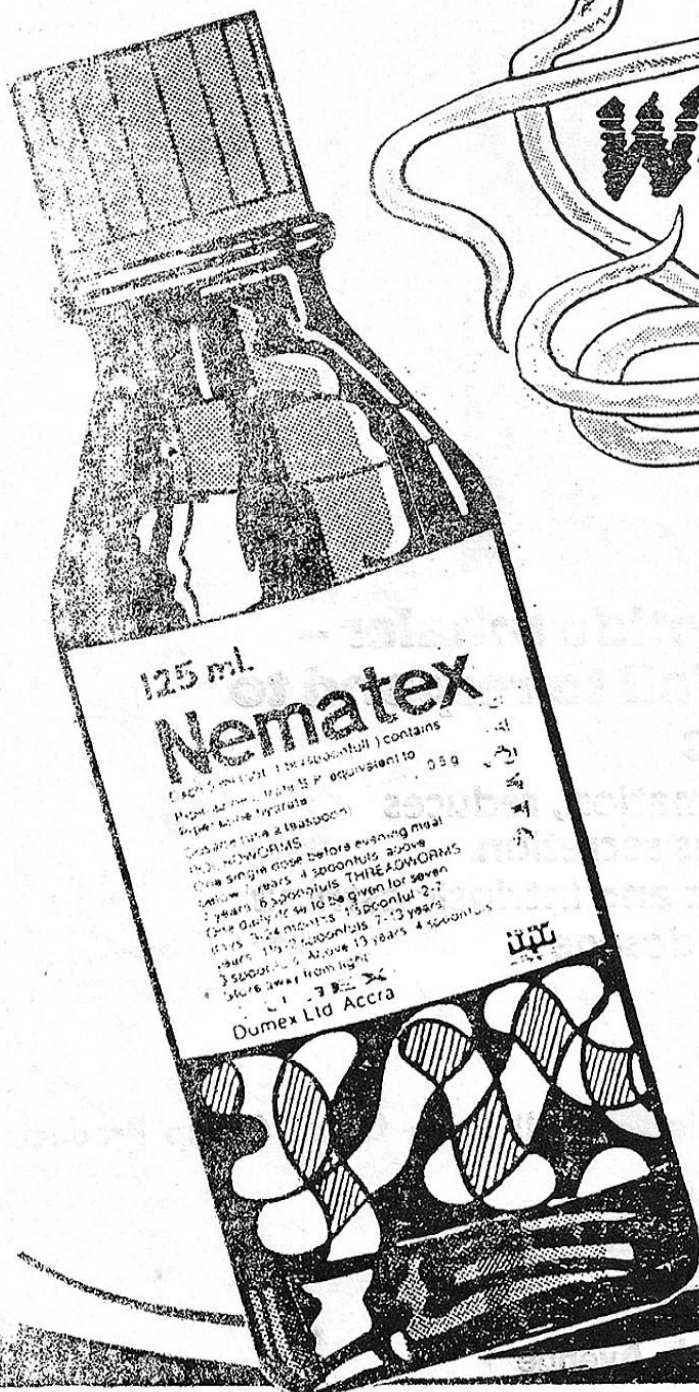
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(Continued from page 10)

was dismissed shortly after its synthesis as being too toxic for clinical use (5). However since its release in 1946 chloroquine has become the most potent and cheapest blood schizonticidal agent and is the drug of choice for the treatment of *P. falciparum* malaria infection along with the other 4-aminoquinoline, amodiaquin.

With a period of two years after their introduction, proguanil and pyrimethamine-resistant strains of human malaria parasites were being recognised. Chloroquine remained the most effective drug for the treatment of human malaria until 1959 when the first cases of *P. falciparum* infection resistant to chloroquine were reported in Thailand, South East Asia and in Colombo, South America in 1960 (6). Chloroquine-resistant *P. falciparum* has subsequently spread to wide areas of South East Asia and South America. The resistant strain of the parasite has manifested itself in East Africa since 1978 (see Figure). The limited study conducted so far indicates that *P. falciparum* infection in the West African subregion is sensitive to chloroquine treatment although there have been unconfirmed reports of Chloroquine-resistant in this part of the world (7 & 8). The spread of chloroquine-resistant *P. falciparum* poses a major threat to the whole of the malaria endemic regions of the world. There is laboratory evidence to indicate that the exposure of chloroquine-sensitive strain of the parasite to non-lethal doses of the antimalarial compound can produce chloroquine-resistant strain (9). This piece of evidence is very important to the West African subregion where there is an indiscriminate use of antimalarial drugs at doses which are in most cases non-lethal to the parasite. There is cross resistance of the parasite to chloroquine and amodiaquin. The importance of chloroquine-resistant strains of the parasite has necessitated the World Health Organization to adopt standard *in vivo* and *in vitro* test systems for the assessment of the

response of *P. falciparum* to chloroquine (10).

Fansidal, a drug combination of sulphadoxine and pyrimethamine was formulated to overcome the problem of drug resistant. However there are now *P. falciparum* resistant strains to this alternative antimalarial drug.

In most countries in South East Asia and South America where chloroquine-resistant strains of the parasite is widespread, chloroquine has completely lost its usefulness for the treatment of *P. falciparum* malaria. In these countries, quinine and the antibiotic, tetracycline, are being employed for the treatment of malaria. These medications are however expensive and cumbersome to administer. This leads to non-compliance on the part of the patient with the consequent high failure rate.

This unhappy state of affairs has led to sustained and systematic effort to develop blood schizonticidal drugs for the treatment of multiple-drug-resistant *falciparum* malaria. Work on quighaosu (artemisinin) the active principle of the Chinese medicinal herb *Artemisia annua*, and its derivatives has resulted in the selection of the water-soluble succinate, artesunate, for preclinical and clinical development. This compound is the fastest-acting blood schizonticidal compound so far known (11).

From this intensive search has also emerged a potent blood schizonticide active against multiple-drug-resistant *P. falciparum*. The compound, mefloquine, is a 4-quinoline-methanol which is more or less a synthetic analogue of the first antimalarial drug, quinine. The development of mefloquine has taken over ten years and has involved the screening of some half a million compounds (12, 13). The Pharmaceutical Company, Hoffman-La Roche, the Walter Reed Army Institute of Research and the Tropical Diseases Research Special Programme of the World Health Organization have collaborated in the development of mefloquine alone (Lariam) and a combination of mefloquine/sulphadoxine / pyri-

methamine (Fansimef) for the treatment of multiple-drug-resistant *P. falciparum* malaria (14). The World Health Organization has stressed that appropriate measures must be taken to prevent the development of mefloquine-resistant *P. falciparum* and has therefore recommended the following measures to be taken in the use of this antimalarial drug: that governments legislate for strict control of the importation, distribution and utilization of Lariam and Fansimef; that the use of mefloquine preparations be restricted to the treatment of acute malaria infections that are likely to be due to multiple-drug-resistant *P. falciparum*.

The fight against malaria infection seems to be a never ending battle. The parasite seems to have the genetic machinery to counteract any chemotherapeutic agent that is developed by man. It is therefore unlikely that the best antimalarial drugs that are available now will be potent for the next thirty years or so. It is in the light of this that the study of the enzymes involved in biochemical processes of the Parasite be given serious attention (15). Inhibitors of these enzymes could then be exploited for the development of new anti-malarial drugs.

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Dual Pharmacological Action of Pentazocine on the Skeletal Muscle of the Frog

by E. Ayitey - Smith

Department of Pharmacology

University of Ghana Medical School

Accra—Ghana

Summary

A study of the effect of pentazocine on the skeletal muscle of the frog has been performed. Relatively low concentrations of pentazocine, 1×10^{-8} to 5×10^{-6} g/ml, non-competitively antagonised acetylcholine but high concentrations 1×10^{-4} to 5×10^{-4} g/ml, induced slowly developing and sustained contractions which were not readily reversible after washing. Moreover, pentazocine antagonised potassium responses but not caffeine which rather inhibited contractions produced by high concentrations of pentazocine. It has been suggested that pentazocine antagonism is non-specific and its agonist action may possibly be mediated through calcium.

Introduction

Pentazocine, a benzomorphan derivative, has both agonist and weak antagonist actions of opioids (Bellville and Forrest, 1968). Apart from its analgesic and central nervous system depressant actions, it is reported to have effects on the gastrointestinal tract, cardiovascular system and the uterus. Thus, pentazocine decreases gastric emptying time in man (Danholff, 1967) and in high doses it increased blood pressure and heart rate by inducing the release of catecholamines in man as shown by increase in plasma catecholamines (Sigman and Elwood, 1967). It however, appears that there is lack of information on the action of penta-

zocine on the skeletal muscle. This study was, therefore undertaken, to find out the effect of pentazocine on the skeletal muscle using frog's rectus abdominus muscle.

Methods

Experiments were performed on rectus abdominis muscle from frogs (*Rana occipitalis*) weighing 70-100g. The rectus abdominis muscle was isolated, divided at the midline and the pair suspended separately under 2g tension in frog's Ringer solution of pH 7.4 (composition (g/l): NaCl

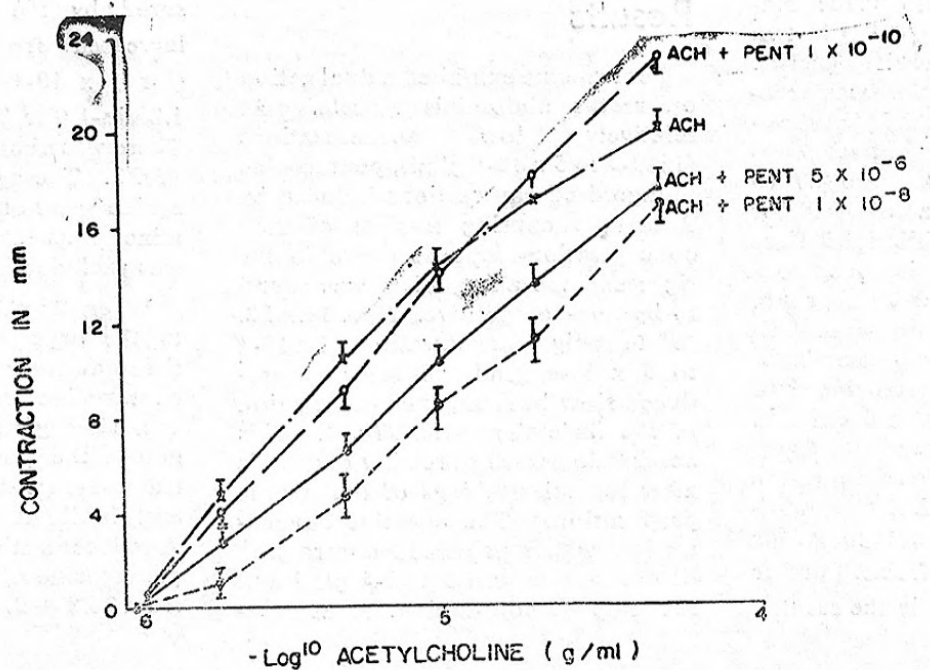


Fig. 1: Concentration-response Curve of Acetylcholine (Ach) showing the antagonism by pentazocine (Pent.) which has its concentrations written against the curves in g/ml. The vertical bars represent standard error of the mean. Four to seven tissues were used for determining each curve.

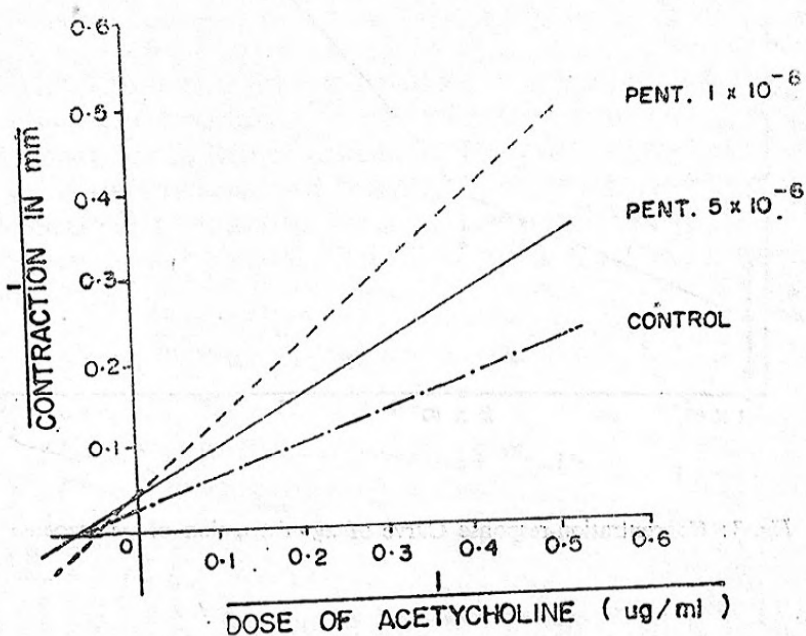


Fig. 2: Double reciprocal plot of non-competitive antagonism of Acetylcholine by pentazocine which has its concentrations written against the curve in g/ml. Control curve is acetylcholine alone.

6.5: KCl 0.14: CaCl₂ 0.12: NaHCO₃ 0.20: NaH₂PO₄ 0.01) in two organ baths (50ml capacity) (Perry, 1968). The Ringer solution was aerated with 95 % oxygen and 5 % carbon dioxide and the experiment was conducted at room temperature (27 to 29 °C). 45 minutes was allowed for the muscle to equilibrate before drugs were tested and isotonic contraction recorded on a kymograph. During the experiment non-cumulative dose-response curves of acetylcholine (Ach) and of pentazocine and responses of potassium and caffeine were determined. Then the drugs were washed out 3 times from the muscle preparations. Later, pentazocine was used as an antagonist for Ach, potassium and caffeine. Further details have been given in the results.

Results

Pentazocine exhibited a dual action on rectus abdominis muscle. At relatively low concentrations (1×10^{-8} to 5×10^{-6} g/ml), pentazocine antagonised contractions induced by Ach thus causing a shift of Ach concentration-response curve to the right and the antagonism was found to be non-competitive. Figs. 1 and 2. While at high concentrations (1×10^{-4} to 5×10^{-4} g/ml) pentazocine produced slow but sustained contraction of the skeletal muscle, Fig. 3. This contraction was not readily reversible after several washings of the muscle preparation. The effective concentration which produced contraction of the muscle was 5×10^{-5} g/ml and the rate of contraction, K as mea-

sured by the slope of the curve increased from $K = 0.45 \text{ min}^{-1}$ (for 1×10^{-4} — 2×10^{-4} g/ml) to $K = 1.2 \text{ min}^{-1}$ (for 2×10^{-4} — 5×10^{-4} g/ml). There was about 3-fold (2.7) increase, Fig. 3. The agonist action of pentazocine was not antagonised by gallamine thus cholinergic mechanism was excluded.

When 40mM potassium was added to the organ bath to contract the tissue and varying concentrations of pentazocine ranging from 5×10^{-6} to 1×10^{-4} g/ml were used to antagonise the potassium induced contractions, pentazocine dose dependently inhibited the contractions, Fig. 4. A concentration of 5×10^{-6} g/ml pentazocine reduced the contractions from $26.8 \pm 2.6 \text{ mm}$ to $24.0 \pm 2.4 \text{ mm}$.

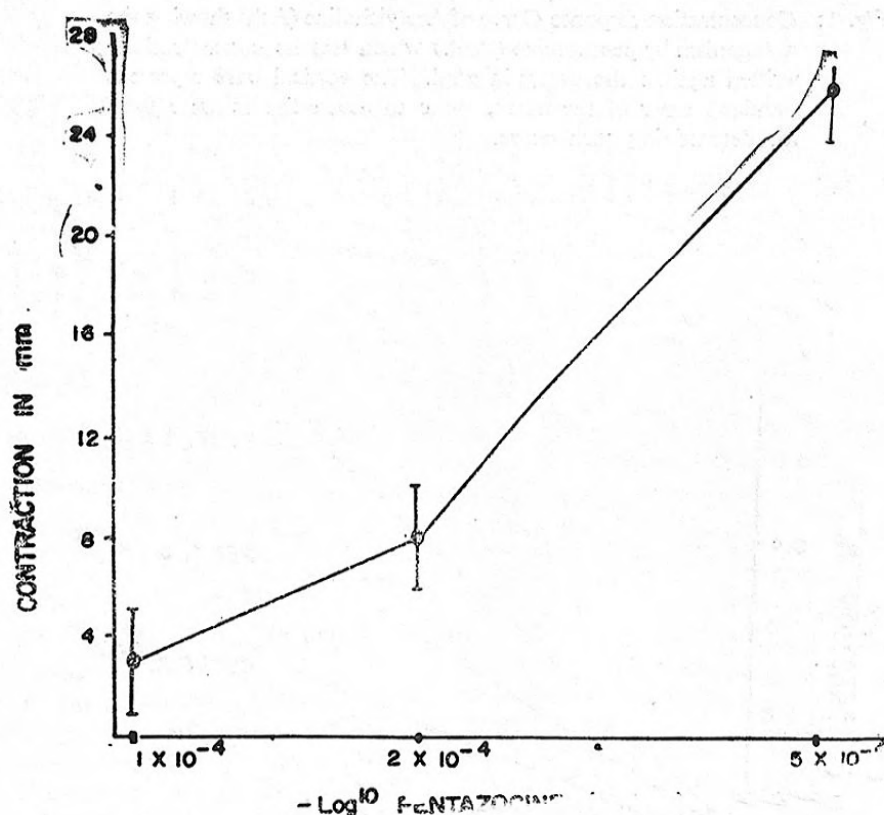


Fig. 3: Concentration-response Curve of agonist action of pentazocine

Treat the total

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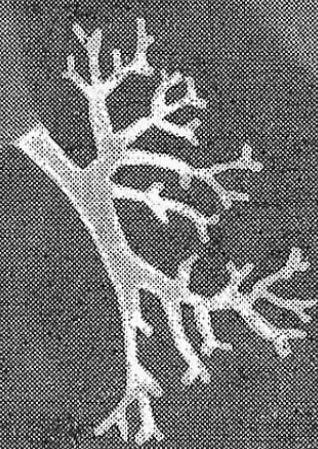
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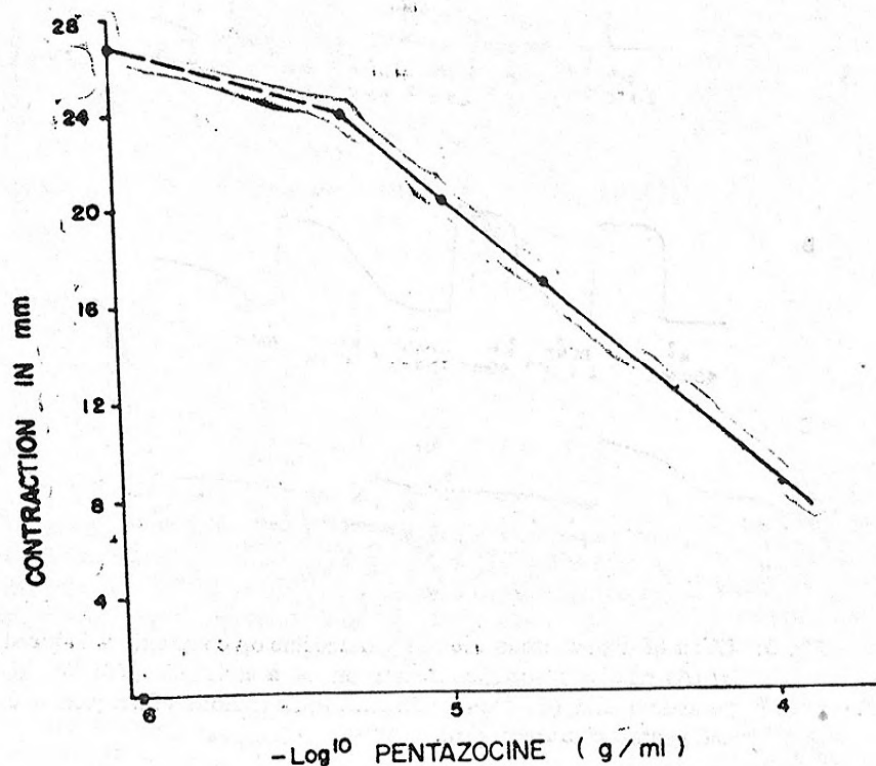


Fig. 4: Concentration-response curve showing the concentration dependent antagonism to 40mM potassium contraction of rectus abdominis muscle.

that was 10.3% and 1×10^{-4} g/ml reduced it to 8.5 ± 1.4 mm, by a percentage of 68.2. However, when high concentrations of pentazocine (2×10^{-4} and 5×10^{-4} g/ml) were added to the tissue in the organ bath followed in few seconds by 40mM potassium the rate and shape of contractions produced differed from those produced by potassium alone. The contractions due to pentazocine appeared to have been superimposed on those of potassium and may be it was an indication of antagonism to potassium. Similar observations were made when acetylcholine (2×10^{-5} g/ml) was used instead of potassium, Fig. 5 A and B. In the case of caffeine, the high concentrations of pentazocine antagonised contractions produced by 5mM caffeine and the typical agonist action of high concentrations of pentazocine was also not observed, Fig. 5c.

Discussion

It has been demonstrated quite clearly that pentazocine has both agonist and antagonist action on the skeletal muscle of the frog. At low concentrations, it non-competitively antagonised cholinergic responses produced by acetylcholine. Moreover, the antagonism was non-specific since pentazocine also antagonised both potassium and caffeine induced contractions. It is, therefore, most unlikely that the antagonism is mediated through cholinergic (nicotinic) receptors. The agonist action of high concentrations of pentazocine may also not be due to cholinergic receptor activation because this was not antagonised by gallamine which blocks nicotinic receptors at the neuromuscular end plate. It,

therefore, appears that the mechanisms by which pentazocine contracts the skeletal muscle or inhibits the action of Ach, potassium and caffeine excludes the cholinergic receptors. The data which showed that caffeine blocked agonist action of pentazocine may suggest that pentazocine-induced contractions may be mediated through calcium because caffeine is known to release trigger calcium which acts as activator for contractions. Furthermore, caffeine inhibits uptake of calcium by the relaxing factor system (Bianchi and Bolton, 1967). From the present data and the available evidence it may be proposed that pentazocine and caffeine may possibly use the same calcium channel to effect contraction but this competitive utilization of calcium may rather block the system and prevent both drugs from inducing contractions.

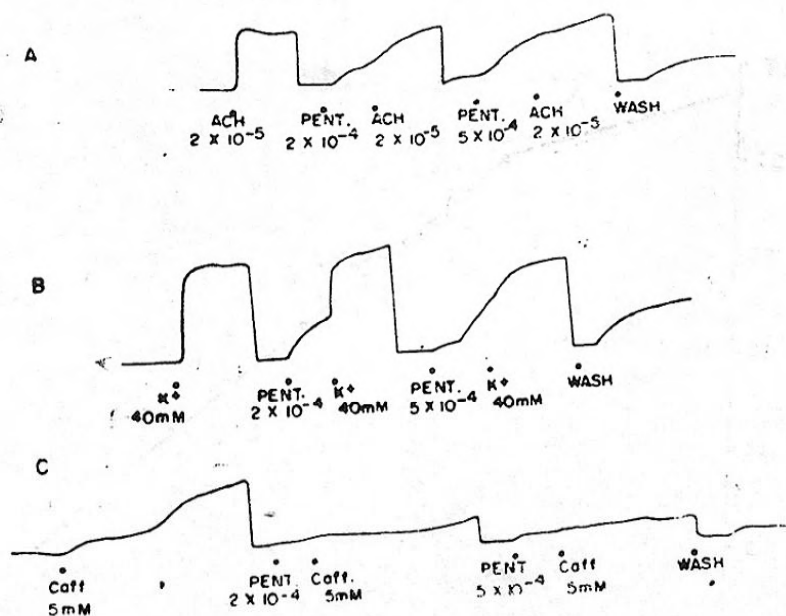


Fig. 5: Effect of high concentration of pentazocine on contractions induced by (A) relatively high concentration of acetylcholine, (B) 40mM potassium and (C) 5mM caffeine. Concentrations of acetylcholine and pentazocine are in g/ml.

Acknowledgement

I wish to express my sincere gratitude to Kwasi Kumi for his excellent technical assistance.

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Comparison of the Analgesic Activity of Ketamine with Morphine

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Summary

1. Ketamine (0.25—1.0 mg/kg; s.c.) caused a dose-dependent increase in reaction time in the rat using the warm water-induced tail withdrawal method.
2. Maximum analgesic effect occurred at 30 mins. after treatment compared with that of morphine which occurred at 60 mins.
3. The analgesic ED₅₀ values (95 % confidence limits) for morphine and ketamine after subcutaneous injections were 1.45 mg/kg (0.8—2.7) and 0.41 mg/kg (0.3—0.6) respectively.
4. 1 mg/kg nalorphine antagonised the analgesic effect of morphine but not that produced by an equipotent amount of ketamine.
5. The result suggests receptors other than the opioid receptors to be involved in ketamine-induced analgesia in the rat.

Introduction

Ketamine (2—(0—chlorophenyl)—2—(methylamino) cyclohexanone), a derivative of phencyclidine is a potent but short-acting anaesthetic agent.

Several workers have reported that ketamine possesses analgesic activity in man which compliments its clinical use as anaesthetic agent. (Austin, 1976; Dundee, 1979). Since the mechanism of analgesic action of ketamine is not known, it was decided to investigate this in the rat with the view of elucidating its possible mechanism of action.

Method

The analgesic activity was determined in 55 naive male albino rats (100—140g) using a modification of the warm water-induced tail withdrawal method (Janssen, Niemegeers and Dony, 1963).

Four groups of five rats in each group were administered with increasing amounts of ketamine hydrochloride (0.25, 0.5, 0.75 and 1.0 mg/kg; s.c.). The lower 5cm portion of the tail was immersed in water maintained at 52° C ($\pm 10^\circ$ C) and the time taken by each animal to withdraw its tail was recorded prior to drug treatment and at 30 mins. time intervals for 2h. after drug treatment. A cut off time of 15s was used in order to avoid trauma. Prolongation of the tail withdrawal response or the change in reaction times in each animal indicative of analgesia was calculated using the formulae.

$$\% \text{ Analgesia} = \frac{RT_t - RT_o}{RT_o} \times 100$$

Where RT_t = reaction time at time (t) after drug treatment
 RT_o = reaction time prior to treatment.

The procedure was repeated using morphine (1.0—6.0 mg/kg; s.c.) and the ED₅₀ values and 95 % confidence limits were calculated according to Litchfield and Wilcoxon (1949).

Results:

Prior to the experiment, the mean reaction times (mean time taken for rats to withdraw tail from warm water) determined in the two groups of rats were $3.28s \pm 0.99$ (n=30) and $5.22s \pm 1.16$ (n=25) for morphine

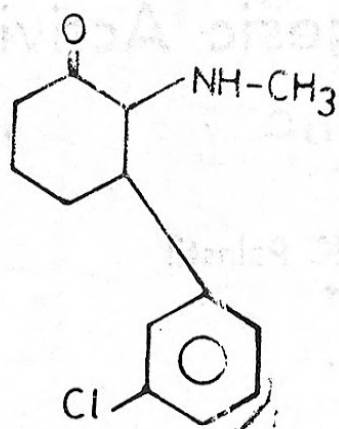
and ketamine respectively. When the two sample means were compared by the student's t-test, there was no significant difference between them ($P > 0.05$).

Ketamine caused a dose-dependent prolongation of the tail withdrawal response in the rat with the maximum effect occurring 30 mins. after subcutaneous injections. Fig. 2 shows the time-course of the warm water-induced tail withdrawal response to ketamine. Unlike morphine, the analgesic effect of ketamine was only detectable 60 mins. after administration. The analgesic ED₅₀ values and 95 % confidence limits determined at maximum effect were found to be 1.45 mg/kg (0.8—2.7) and 0.41 mg/kg (0.3—0.6) for morphine and ketamine respectively.

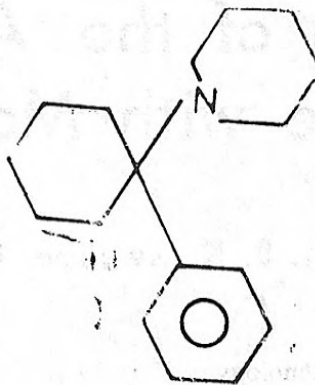
Fig. 3. shows the effect of the morphine antagonist nalorphine (1 mg/kg; s.c.) administered 5 mins. prior to treatment of different groups of rats with either normal saline (0.9 % NaCl solution in water), or equipotent doses of morphine (1.5 mg/kg) or ketamine (0.5 mg/kg). Nalorphine antagonised the analgesic effect of morphine but was without an effect on ketamine-induced analgesia.

Discussion

The two methods which have been extensively used for analgesic testing are the hot plate (Woolfe and Macdonald, 1944) and the radiant heat (tail-flick) method of D'Amour and Smith (1941). One major disadvantage common to these methods is the production of frank tissue damage which could confound the experimental observation even when 15s cut-off time is used (Winter, 1965).



KETAMINE



PHENCYCLIDINE

FIG 1

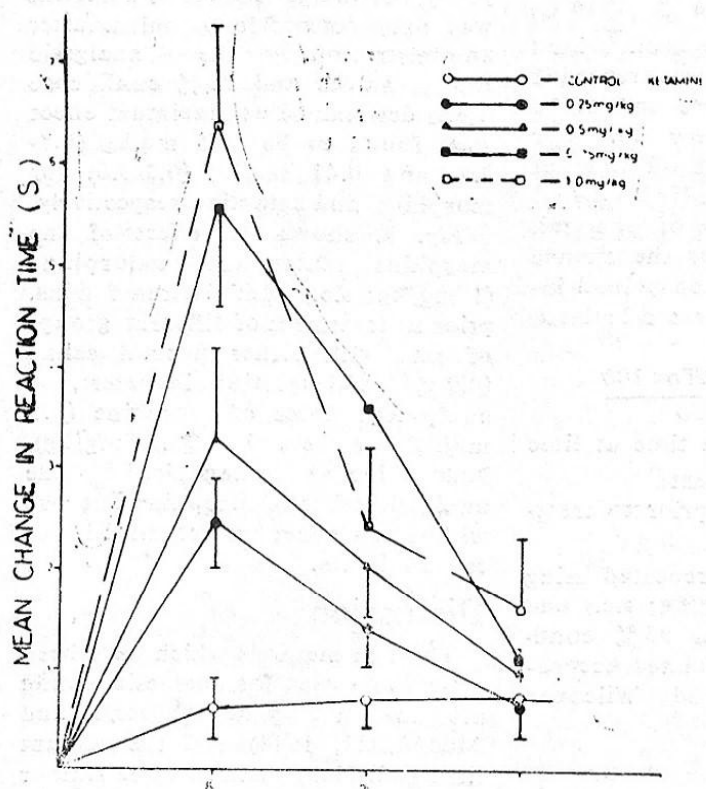


FIG II

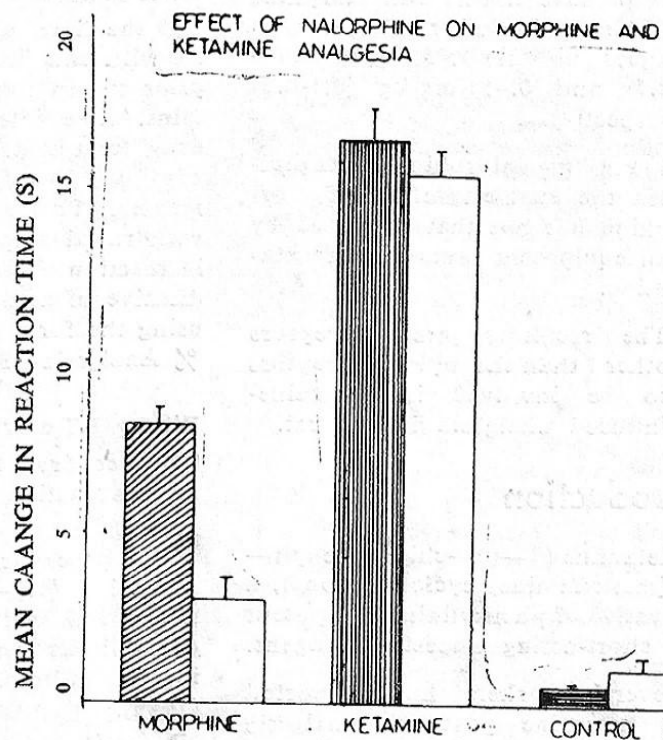


FIG III

The present investigation employed a modification of the rat tail-flick method (Ben-Bassat, Peretz and Sulman 1959) using warm water as the thermal stimulus rather than radiant heat. Unlike other methods, the warm water method does not require any sophisticated equipment and in addition to the absence of tissue damage even after a chronic exposure to this stimulus (Miksic et al, 1977; Chesher Chang and Whaite, 1980). Niemegeers, Lenaerts and Awouters (1976) found that it was capable of measuring analgesia produced by a variety of narcotic analgesics.

The method used has demonstrated that ketamine is a highly potent analgesic drug in the rat and this confirms the clinical observation on this anaesthetic agent (Austin, 1976, Dundee, 1979). However, the observation that a dose of the narcotic antagonist (1 mg/kg nalorphine) which antagonised an equipotent dose of morphine failed to antagonise the analgesic effect of ketamine may indicate that receptors other than opioid receptors may

be involved in ketamine-induced analgesia. Peak analgesic effect observed at 30 mins. after a subcutaneous administration is similar to its anaesthetic action which lasts for only 15-20 mins. indicating a short-acting compound.

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The Executive Initiation, Control, Growth and Stabilization of Language: Its Phylogeny and Ontogeny

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Introduction

LANGUAGE may be defined as the statistical resultant of the interplay between the signs and symbols by which man communicates with his peers.

"Nature had indeed paved the way for man's earliest attempts at significance; for there is an aboriginal semantics that precedes all special signals and signs. The 'semantics of concrete existence' as one may call it, is basic to all languages and modes of interpretation" (Mumford, 1967.)

According to Leslie White (1959), "The ability to symbol, primarily in its expression in articulate speech, is the basis and substance of all human behaviour. It was the means by which culture was brought into existence and the means of its perpetuation since the origin of man".

When one dips into the very dim vistas of bygone ages, as far as scientific, historical and archaeological hind sight could permit, one cannot help corroborating Lewis Mumford's view: (1) that language was a life-reflecting, life-enhancing instrument long before it could be shaped for the restricted purposes of intelligent communication, and (2) that the very qualities in language that offend the logical positivist—its vagueness, its indeterminateness, its ambiguity, its emotional colouring, its reference to unseen objects or unverifiable events, in short its subjectivity—only indicate that from the beginning it was an instrument for embracing the living body of human experience, not just the bleached articulated skeleton of definable ideas. He also maintains, and rightly so, that vol-

uminous oral expression must have preceded content, intelligible speech by untold years.

Components of Language

The components of language are many and varied. Head movements, eye and tongue movements and facial expressions are some components of language directly under the influence of the brain as are those of the lips. Body and limb movements whether purposive or conditional, are other fascinating components of language. Sartorial taste and comportment, touch, reading, writing, painting, building, sculpture, architecture, horticulture, music, literature, crying, laughing and speech constitute proper components of the province of language. Under the penumbra of language are also the many varieties of calculation—mental, oral, written, symbolic etc.

Factors Influencing Language

A galaxy of factors influences language. The repetition, in an abbreviated manner, of the ancestral history of the human race, in embryonic life, is a fundamental factor that influences language. Influence may also be congenital or familial. Paternal, maternal, environmental and cultural factors almost always vary and indelibly influence language.

Varieties of Language

The varieties of language are dismaying in number. Thus there

is universal language like Esperanto, the occumenical language of the churches and the national languages of national groups. Common to all are provincial and district languages as are those of tribes, smaller ethnic groups and atomistic societies. It is fashionable to talk of the language of philosophy, of spiritual language, of the language of politics and of language of commerce and economics. Certain occupations have their etymological peculiarities and hazards. What commends itself to the author's taste and holds much fascination for him is the species of language adumbrated in the terms professional, historical and psychic language; inspirational language and language of inspiration; emotional, constitutional, religious and scientific language. There is also the language of diplomacy. God used divine language to create the universe (GENESIS, 1).

Phylogeny and Ontogeny of Language

The phylogeny of language is epitomized in the following quotation: "Every being, whether it be a star or a rock, a flea or a fish, speaks for itself: its own shape, magnitude, character, identify it and concretely 'symbolize' it: by association, that shape and character constitute its meaning to other higher organisms that encounter it. A lion says 'lion' by its own presence far more emphatically than the word 'lion' even if shouted: and the lion's roar, an abstraction, calls up by association the predatory threat of the animal himself. No words are needed to make an antelope flee. Free-moving animals

live in a meaningful environment; and their correct interpretation of the manifold concrete meanings is essential to their physical survival. By an elementary system of signals—cries, barks, gestures—they convey meanings to their own kind: Eat! Flee! Fight! Follow me!” (Lewis Mumford, 1967).

Development and turn of language in mankind is phylogenically the same but ontologically depends on various factors. LOA presentation of human foetuses constitutes about 85% of the whole. Thus, barring intranatal and post-natal accidents and physical and chemical insults, 85% of the world population have their speech centres in the left dominant cerebral hemisphere and are right handed. About 10% of presentation of human foetuses are ROA, who turn out after smooth intra- and post-natal life, to be left handed people with their speech centres in the dominant right cerebral hemisphere. Roughly 5% of human foetuses are of the “floating” variety and they are usually the precursors of those adult members of mankind who are ambidextrous and have their speech centres in both cerebral hemispheres. The association of handedness and cerebral dominance can be gleaned from the movement of one upper limb of the human foetus and the migration of nerve cells and fibres to the opposite side at a certain stage in the development of the human brain in embryo.

Development and eventual characteristic, individual turn of language is the product of the interaction of many factors and issues. The situation of the father and mother, matrimonially, culturally, economically and religiously plays an important role in this regard. The environment, embracing the geometry of the home and geography of the immediate and remote surroundings with the quantity and quality of the inhabitants thereof, is a potent factor in the moulding and shaping of the language of an individual. The historical situation of the place and country of birth; the intervention of cataclysms like war, pestilence, and of scientific, political, and industrial revolutions; and the commercial proclivities and

activities of the nation and her socio-cultural and scientific intercourse with other nations, all make their impress on the development of and are part and parcel of the core of a person's language. Not less important is the attitude of the parents to the realities and ideals of life. What caps the above factors in permanence and solidly with respect to the language of the individual is, his exposure, in the early years of life to educational encounters and stresses, his coming face to face with the various aspects of his ancestral culture, and, above all, his conflicts and frustrations, his fears and hopes, his sentiments and sadness, his successes and failures, his joy and happiness, and his play and laughter. Underlying all these is the integrative action of his central nervous system.

The Executive Role of the Central Nervous System in the Control and Modification of Language

The frontal, parietal, temporal and occipital lobes of the brain, and Broca's primary speech area, the Island of Reil (insula), the hypothalamus, the mid brain and the cerebellar hemispheres are by their actions and interactions, the composite anatomical and physiological substrates of language. Clinical observations of and studies on patients spanning some 15 years or more have yielded the following:-

Ability for language of adoration requires and mainly depends upon the executive electrical activity of the frontal lobes—predominantly the left in right-handed persons, and the right in left-handed persons.

Adepts in language of history, and, for that matter, great, exceptional and admirable historians, have predominantly well developed mamillo-thalamic tract and mid-brain!

Proficiency in mathematics and impressive mathematical perspecu-

ity, as in the case of the late legendary Albert Einstein, necessarily emanate mainly from an extremely developed and intact dominant parietal and frontal lobes.

The fascinating, arresting, moving, alerting and expectation-on-tip-toe language of commentators of national festivities, spectacles, sports, pageantry, etc., surely cannot be executed without the integrative action of the frontal, parietal and occipital lobes. The activities of the dominant parietal lobe, the temporal lobes and hypothalamus go into the production of the language of music and literature. It is doubtful whether the language of the emotions can be well and effectively exhibited without the integrity, actions and interactions of the hypothalamus, the frontal, temporal and non-dominant parietal lobes. The language of philosophy and its nuances emanate from the electro-physiological activities of the overall and highest correlative centres situated in the frontal lobes.

The symbolic language of pure and applied science as well as the language of number, in many ways the pride and addendum of modern civilization, is the product of the phylogenetic and ontogenetic performances of the normal electrical waves, of, and the consequent increase in synapses in and synaptic connections among the frontal, parietal and temporal lobes. Language purporting peace and the language of war are the manifestations of hyperactivity and hypoactivity, respectively, of the hypothalamus and the temporal lobes. This is indeed a terse summary of the detailed situation.

Intact and phylogenetically and ontogenitically well-developed nuclei dentatus, fastigius, emboliformis et globosus and their various connexions are a necessary prerequisite of distinct and clear articulation.

The physiology of laughter, the light aspect of language, can be explained by the combined integrative activity of the cranial nerves.

Anatomical Zones related to Various and Varying Aspects of Speech

Before expatiating on the anatomical zones related to various and varying aspects of speech, it is pertinent to observe that emotions and intellectual decisions are cortical in origin; the hypothalamus is an internode in the corticohypothalamic mechanism regulating autonomic activities. The pathways in general provide for emotional accompaniments to cortically initiated motor responses carried over pyramidal and extrapyramidal systems. Anatomico-physiological studies indicate that they are supplemented by corticoregimental arcs concerned with somatic motor responses that express emotional states. It is becoming increasingly evident that pyramidal as well as extrapyramidal systems carry corticofugal fibres for autonomic centres of the spinal cord (Spiegel, E. A. et al). APHA-

SIA is loss of the ability to comprehend or express signs and symbols by which a human being communicates with his peers (Nielson, 1946). It is the result of organic disease of the cerebral memory engrams (mechanisms) for language. Such defects of speech do not involve the cortical or basal centres or paths concerned with the movements of the organs of speech (larynx, tongue, lips—vide supra). The observation that may result from lesions in more or less localized areas does not necessarily imply that specific functions as such are located in some special region.

On the contrary, areas where aphasia are obtained are nodal points in association parts or cortical areas of particularly rich and specific associations. Besides, such areas are richly interconnected with each other so that, according to Penfield and Roberts (1959) it is unlikely that one type of aphasia exists without some defects in, or indications of other types as well.

Aphasia may be motor (or expressive) or sensory (receptive) in

variety. Combined motor and sensory aphasia constitute global (universal or catholic) aphasia. When the lesion or lesions involve the grey and underlying white matter of Broca's convolution in the dominant hemisphere, usually the left (vide supra), a motor aphasia often results. It is fashionable to apply the term "Broca's convolution" to portions of the opercular and part of the triangular portions of the inferior frontal gyrus (Fig. 1). The exact limits of this convolution is difficult to glean from the earlier descriptions or material of BROCA. The white matter in this area contains association pathways between occipital, parietal and temporal association areas, on the one hand, and frontal cortex on the other. It also contains the connexions of this region of the inferior frontal gyrus with the portions of the motor cortex concerned with the innervation of the organs of speech. Therefore, injuries extending into the white matter in this area involve the pathways and connexions mentioned above. Total destruction of

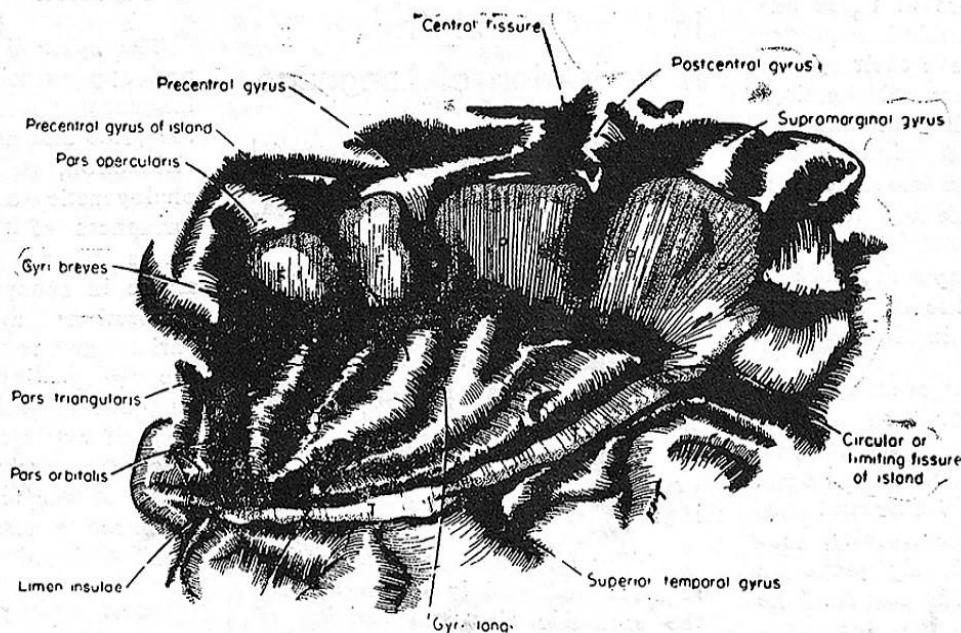


Fig. 1

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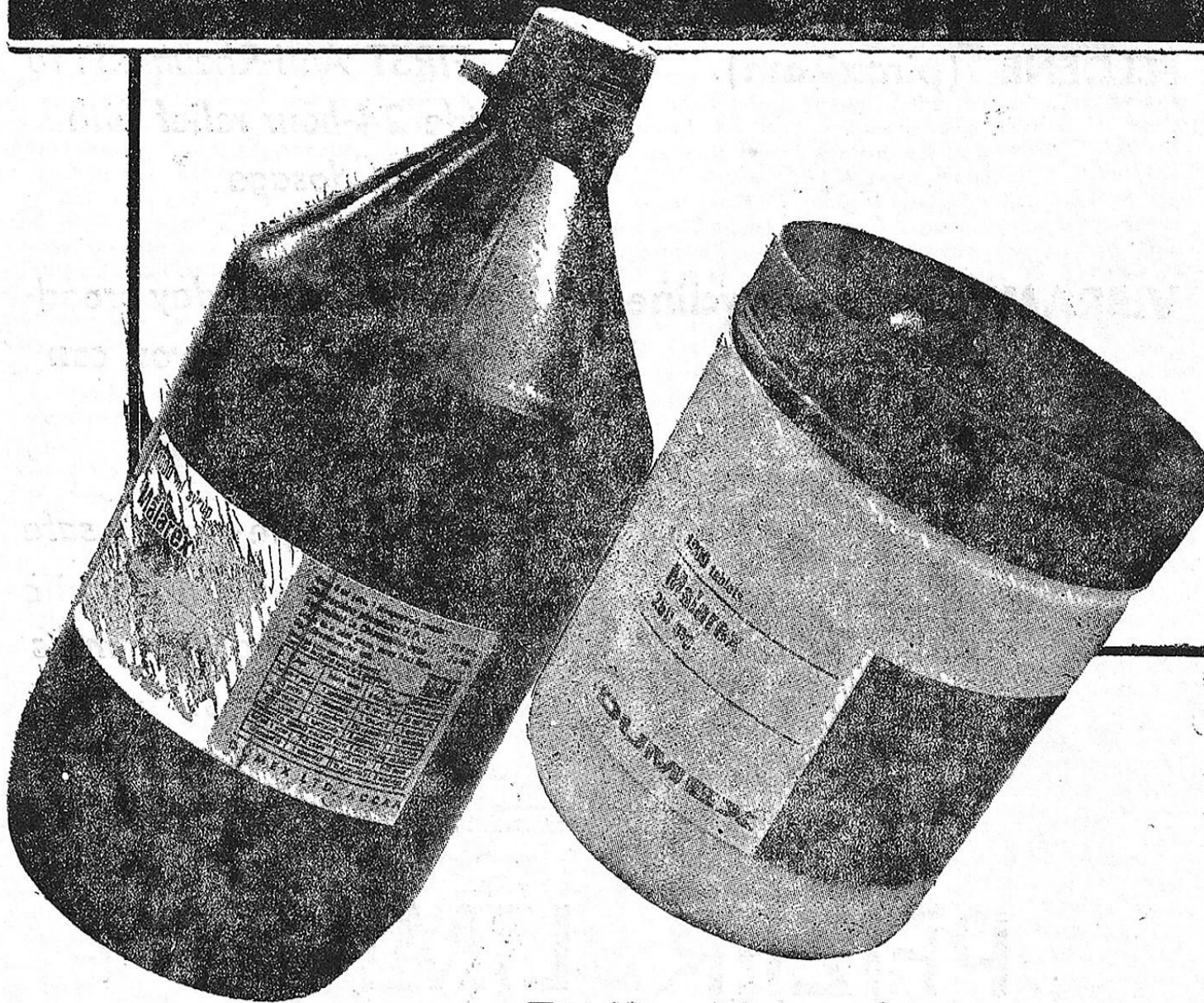
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the area may result in total loss of articulate speech, although the muscles of the organs of speech are not paralysed. When involvement by injury is less or subtotal the patient may be able to utter a single word (usually the last word said before the injury), or utter repeatedly only the same word or syllable (perseveration), or wrongly pronounce familiar words. It is noteworthy that when emotionally provoked or under great emotional tension, they may utter words or phrases they cannot verbally produce under other conditions. This prompts the suggestion that either the centres responsible for emotional speech are bilaterally represented or located or they have different cortical connexions. Furstenburg (1958) has certainly shown that there are regions of the cortex other than the primary motor area from which

laryngeal movements may be elicited on stimulation in primates.

Nielson (1948) says singing or rhythmic speech is bilaterally represented in the cortex and is located in the more frontal area of the triangular part of the inferior frontal convolution (area 45 of Brodmann).

The so-called word deafness is a type of receptive auditory aphasia which is a consequence of lesions in the region of area 22 (*Fig. II & III*) where it borders on the auditory centre (areas 41 and 42), in which, when areas 41 and 42 are not involved the meaningfulness of words is lost. Because what is said to them is not understood by them, they are not able to obey oral commands, neither can they write from dictation; not only is their speech a confused affair, but

they at times speak jargon because they do not understand what they themselves have said. The common indices here are hesitancy, perseveration and the use of the wrong words (malapropism). If the destruction is not of staggering immensity, emotional language, such as swearing, may help them hurdle over this impediment. Word deafness is most pronounced when lesions in the regions of areas 22, 41, and 42 are bilateral. However, some dysfunctions may be observed from destruction in the dominant hemisphere.

The literature abundantly yields reports of cases where an individual could understand his native language but not one learned later in life (Nielson, 1946) although Penfield and Roberts (1959) do not agree with these observations.

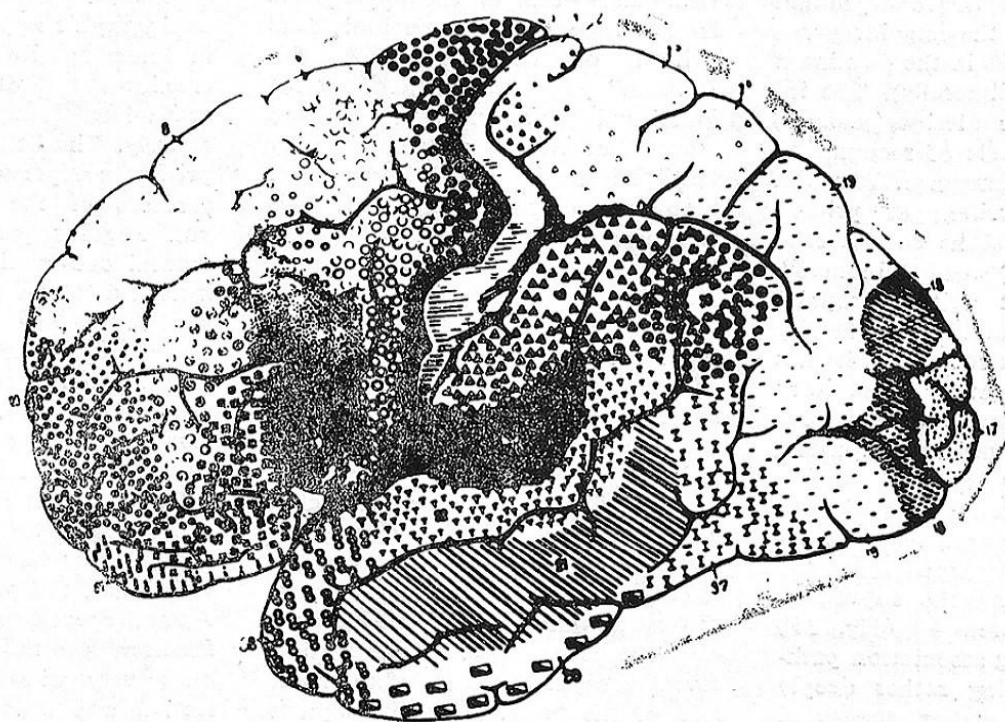


Fig. 11 Cytoarchitectonic Map of the Convexity of the Hemisphere

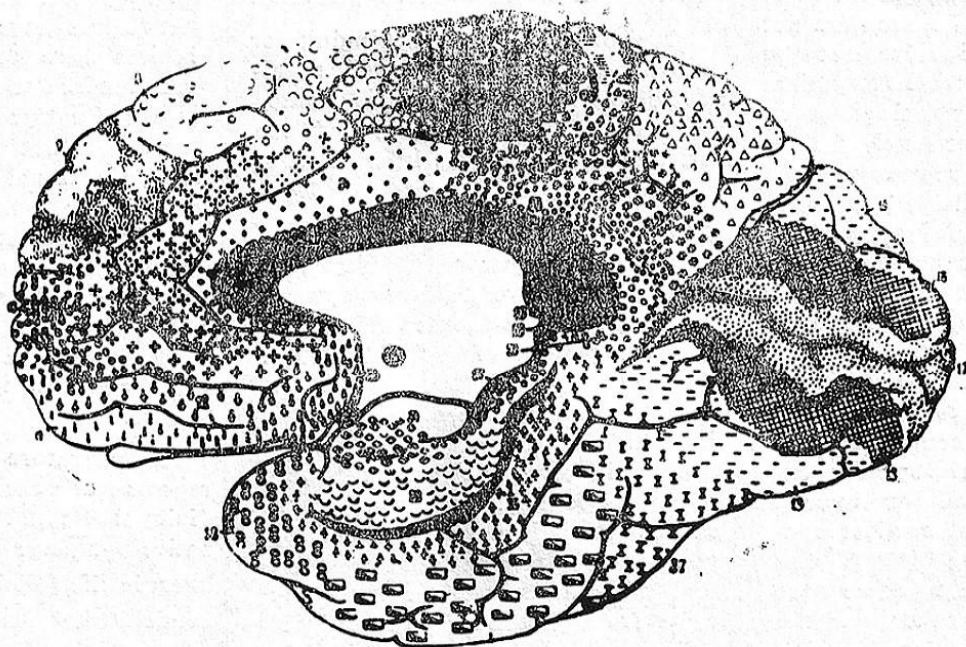


Fig. III The Medial Surface of the Hemisphere

Another disorder of language fairly commonly met with is the so-called visual receptive (or sensory) aphasia which is the end-product of destruction of the angular gyrus or area 39 (Fig. IV) in the dominant hemisphere (or bilaterally). The individual with such a lesion (malady) is no longer capable of recognizing the symbols for language. For him recognition of written or printed words is lost, and he cannot read (alexia)—this is “word blindness”. He either cannot write (agraphia) or writes poorly and with difficulty because he cannot read what he has written. A combination of auditory and visual associative defects produces Wernicke’s variety of aphasia, and is caused by lesions involving area 22 and extending posterior to the superior temporal gyrus to involve the angular gyrus.

Lesions involving the supramarginal gyrus or area 40 (Fig. IV) and the underlying association pathways and extending rather deeply into the white matter, cause a patient to lose the symbolism of language (H. HEAD, 1920). For him the vehicle of expression of thoughts is no longer words, even though he is still capable of thinking. In this case his muteness is like that of a person with a complete motor aphasia.

A large lesion situated in the dominant subfrontal zone and pressing on the orbital, opercular and triangular parts of the appropriate frontal lobe produces an individual edition of the “TOWER OF BABEL” phenomenon in which the individual understands spoken words but makes conversation by bewildering mixture of words from many and different languages. This is illustrated by the following case history.

N.W., a male patient aged 48 was in February 1976 admitted to the Neurosurgical Unit on account of headaches and disturbance of speech of six months duration. He was, six months before admission going on a journey when he suddenly began to have headaches and he noticed that his manner of talking had changed. He observed that when he spoke he uttered different words from many and different languages. Examination revealed slight weakness of the right side of the body. He had incipient optic atrophy on the left side, papilloedema on the right and loss of sense of smell on the left (Foster Kennedy syndrome). His speech was commingled and a composite heap of words and phrases from Moshie (his mother tongue), Hausa, Akan, English, French, Dagbani

and Ga. Left carotid angiography revealed a fairly circumscribed rather vascular lesion in the left subfrontal zone. Right carotid angiographic appearances were within normal limits. Left frontal craniotomy was done and a capsulated mass was removed entirely. The bed of the mass comprised compressed and contused surfaces of the orbital, opercular and angular parts of the inferior frontal convolution. The mass was incised and was found to be full of pus! A few days after operation his speech had returned to normal and he was uninterruptedly Moshie in village (vide supra). Discharged home a few weeks after operation, he has been lost to follow-up.

The aphasias due to organic damage of the brain apart (vide supra) speech may also be impeded by emotional, and physiological factors. Again, speech is a very complex function of the brain, depending on a very wide spectrum of intellectual and emotional factors.

The literature is replete with much discussion over the question of dominance of one cerebral hemisphere being dominant over the other. The left cerebral hemisphere, in right-handed individuals has, for many years, been considered to be dominant over the other hemisphere (Nielsen 1940).

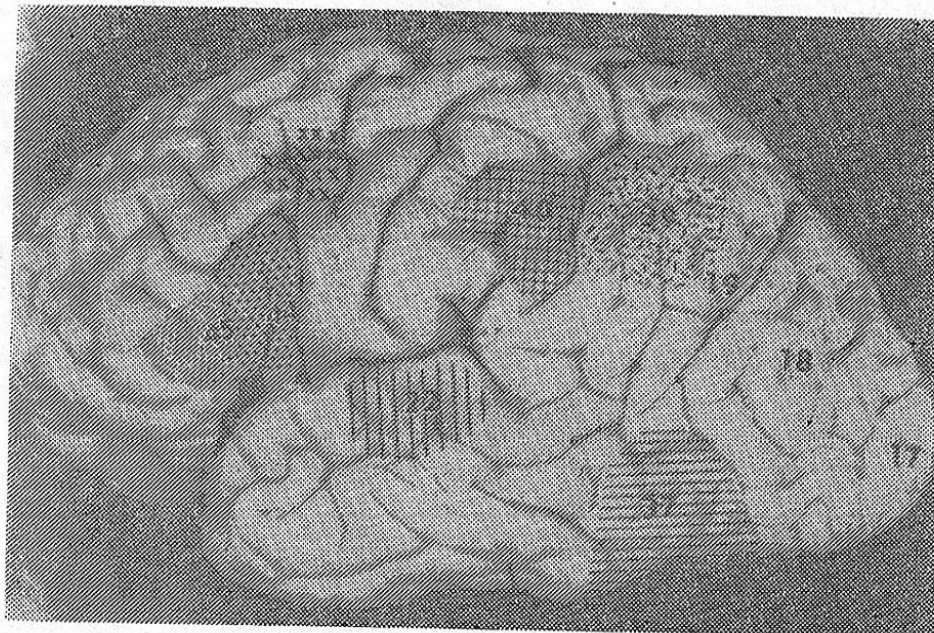


Fig. IV

Because many of the observed and recorded aphasia result from lesions in the left hemisphere, a relation between handedness and speech has been postulated and generally accepted (op cit). Some observers, however, do not believe that such a relation exists (Nielsen, 1946). The evidence must be tempered with the noteworthy fact that some individuals have changed handedness and others are more or less ambidextrous. There have been recorded in the literature cases in which, in left handed individuals, lesions in the appropriate zones of the right hemisphere resulted in aphasia of various types (Humphrey et al, 1952, and Nielsen, 1946).

Stammering is a defect of speech which occasionally develops with an enforced change of handedness in childhood. It is thought by some that this phenomenon of stammering may be an indication of the relation between speech and handedness. Others believe that it is due to general emotional block. It is known and it is a fact that patterns of speech are established after birth (of symbols of language which are established in embryo). It is also known and it is true that a child with a birth injury in the triangular gyrus of either side learns to speak without difficulty by using the other hemisphere. This may be explained

by the observation that mankind's nervous system ceases to grow after about 25 years of life on earth. We have cases on record at Korle-Bu Teaching Hospital indicating that training by speech therapists has enabled individuals who have an expressive aphasia, due to brain damage to speak clearly, adequately and distinctly again. Our experiences corroborate those of GRANICH (1947).

Another defect of language is apraxia which is synonymous with inability to perform skilled and intricate movements, even if voluntary movement of part is not implicated. Involvements of the motor association fields of the frontal lobe anterior to the motor cortex and dorsal to the pars opercularis in the middle frontal gyrus may result in motor apraxias. Patients with such apraxias display difficulty with and are clumsy in the execution of skilled movements such as writing (agraphia.)

Lesions of the parietal association cortex produce quite different apraxias, as the proprioceptive component are essential parts of all skilled movements. When his parietal lobe is thus involved, the patient may be able to perform in a satisfactory manner a single movement and yet be unable to carry out a sequence of such movements. For instance he may be able to write

when given a pen but unable, on command, to take a pen, dip it in ink and write. For him such sequence of movements is an utter impossibility. When large zones of parietal cortex are involved by massive lesions the individual behaves in a manner akin to that of an extremely absent-minded don. Thus, he may try to wear the left shoe on the right foot, or he may mistake his trouser leg for a coat or shirt sleeve and put it on his arm. He may also try to eat his soup with a fork.

Considerable injury to the dominant parietal lobe may give rise to constructional apraxia in which the individual is unable to trace his steps back home when he has gone out. The following illustrates this phenomenon.

K. G., male, aged 36, a right-handed person, was attacked by wastrels and gangsters and hit on the left side of the head by a crowbar. He immediately fell unconscious to the ground and fitted for some minutes. On coming round he became berserk and was shouting his guts out. Arrested by the police for disturbing the peace, he was found to have sustained injury to the left side of his head. He was, therefore, rushed to the nearest hospital where examination showed that he had sustained compound depressed comminuted frac-

ture of the left parietal bone, and from where he was transferred to the Neurosurgical Unit of K.T.H. At operation, the depressed bone fragments were removed as was the extradural haematoma. Dura was contused and torn in parts. Dural flaps were turned and fresh subdural haematoma was evacuated. The underlying parietal cortex posterior to the sensory-motor area was found to be contused and lacerated. Haemostasis was secured and wound closed up in layers, leaving a skull defect measuring 4cm x 4cm. His postoperative course was smooth, but it was found that he could not recognize relatives, friends etc. When discharged home he was found to be unable to come back home whenever he went for a breeze. This constructional apraxia continued to be troublesome for about 18 months when his relations took him away for indigenous treatment.

There are certain man-made addenda and ancillaries to language. Examples are talking drums, the organ, the violin, the flute, the cornet, the bugle, the band, the guitar, the whistle, and all forms of missile. Proper, accurate and meaningful manipulation of these addenda of and ancillaries to language necessarily depends on the integrative action of a normal and intact central nervous system. It follows that the manipulator of any of these addenda and ancillaries who suffers with organic disease of the cortex, and, therefore, of the brain, cannot communicate accurately with his fellow human beings. Conversely, a person with organic disease of the appropriate parts of the brain cannot glean the meaning of the various manipulations, by a normal person, of these addenda of and ancillaries to language. In the final analysis these defects are different forms of motor and sensory aphasia; with an admixture of apraxias.

Loss and Recovery of Speech (Language)

Loss of speech may be permanent or temporary, and is due to a variety of lesions (injury, neoplasm infection, inflammation, haemor-

rhage, etc.) involving the appropriate areas of the brain (vide supra). It is axiomatic, at least in the present state of our knowledge and in the normal life span, that recovery from permanent loss of speech is usually impossible. On the other hand recovery from temporary loss of speech is possible both in quantity and quality, and is either complete or partial. Our observations of patients who have suffered loss of speech due to any cause indicate that the recovery of speech in quantity and quality varies inversely with the age of the patient. Our observations further indicate that on the whole patients who suffer loss of speech before the age of 25 tend to recover completely while recovery after that age is either incomplete or impossible, even if the underlying cause has been totally removed.

Many clinicians no doubt have observed stages in the recovery of speech. The author has however not been successful in his search for report of such cases in the literature.

R.K.A. a right-handed 9 year-old male patient was on July 23, 1983 admitted to the neurosurgical unit of Korle-Bu Teaching Hospital on account of unsteadiness of gait and progressive reduction in speech for four months duration. On March 5, 1983 about 4-1/2 months before admission, he had fallen from a tree, landing on his vertex and then subsiding on the ground on his left side. He did not lose consciousness. He had not been able to turn the head to the right since the fall. He vomited twice on the fourth day. He had been increasingly unsteady in his gait and had been falling to the left since the head injury. Speech had increasingly reduced until 4 days before admission when it was lost. Examination showed that he had global aphasia. He had nystagmus on looking to the left. He had right facial palsy. He was weak on the right side. Reflexes were diminished on the right and the plantar reflexes were extensor.

He was ataxic and tended to fall to the left. A clinical diagnosis of mainly left-sided subdural haematoma was made. He was on July 29, 1983 operated upon and right frontal extradural and subdural haemato-

ma, massive left frontal subdural and even more massive left parietal subdural haematoma was evacuated. The brain was pushed away more than 3cm from the inner surface of the dura in the left parietal zone, and was contused in all areas from which the haematoma was evacuated. He remained aphasic and restless for 5 days following operation. This was the stage of mutism. Thereafter the following stages in the recovery of his speech and other aspects of language were observed (from 3/8/83 to 10/9/83—about 5 weeks):

(1) STAGE of crying on being greeted, spoken to or on being asked questions. (cf the language of babies for attention, feeding, pain etc., which is crying). This stage lasted for about 5 days.

(2) STAGE of Easy Risibility on being greeted, spoken to, or asked questions. This stage lasted for about 5 days.

(3) STAGE of Sparse Risibility and attempts at making words. It spanned about 4 days.

(4) STAGE of halting, staccato speech interspersed with bouts of vibrant laughter. It spanned about 4 days.

(5) STAGE of quasi-flowing rather undertoned speech with pen-sive mood. This stage went on for about 4 days.

(6) STAGE of normal high-toned speech with excessive laughter for any light occasion. This stage embraced roughly 4 days.

(7) STAGE of normal speech with excessive laughter for any light occasion coupled with stubbornness of resolution. It lasted for about 4 days.

(8) STAGE of normal speech with normal laughter. It went on for some days and then

(9) STAGE of pleasure, pride, and happiness at the recovery of language. This stage dovetailed into that of the day of discharge when he talked, laughed, ran about, fooled about and ate a lot and when he was extremely alert and intelligent.

It is thus evident that in his stages

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of recovery of language he recapitulated the ontogenetic growth of his language up to the time of his injury and consequent loss of the symbols of language. It is interesting to note that his recovery embraced the resurrection of the knowledge of his native tongue (Twi) and his learned languages (English, French, Ewe, and Hausa) and also his pre-morbid tom-foolery!

In contrast to the above case-history may be mentioned that of K.W. and A.M., both male patients over 25 years of age (one aged 37 and the other aged 42) who sustained similar injuries to their dominant frontal and parietal lobes, and who, several years after operative treatment have not yet recovered at least their power of speech.

Summary and Conclusions

This paper is a modest attempt to show and discuss some of the anatomicophysiological substrates of language, and its growth and evolution through the ages. It is not an attempt to present the philosophical, anthropological, historical, concological, semantic, socialistic, religious, cultural, geographical, political and occumenical views on the origin of language. In short it is an attempt to indicate that the growth and evolution of language is a product of the growth and evolution of the human brain, a brain that, barring accidents and cataclysms, evolves every century.

In conclusion, I quote the following from the writings of Lewis Mumford (1967):

"What Freud mistakenly regarded as the infantile illusion of the

omnipotence of thought is indeed an over-credulous surrender to the magic power of words. Yet to deny their omnipotence or their omniscience is not to belittle their actual function in influencing human conduct and in making possible the correct interpretation of natural events, beyond what is open to animal intelligence. The fact is that, right up to our own time, language has surpassed any other form of tool or machine as a technical instrument: in its ideal structure and its daily performance, it still stands as a model, though an unnoticed one, for all other kinds of effective prefabrication, standardization, and mass consumption."

"This is not so absurd a claim as it may at first seem. Language, to begin with, is the most transportable and storable, the most easily diffusible, of all social artifacts: the most ethereal of cultural agents, and for that reason the only one capable of indefinite multiplication and storage of meanings without over-crowding the living spaces of the planet. Once well started, the production of words introduced the first real economy of abundance, which provided for continuous production, replacement, and ceaseless invention, yet incorporated built-in controls that prevented the present-day malpractices of automatic expansion, reckless inflation, and premature absolescence. Language is the great container of culture. Because of the stability of every language, each generation has been able to carry over and pass on a significant portion of previous history, even when it has not been otherwise recorded. And no matter how much the outer scene changes,

through language man retains an inner scene where he is at home with his own mind, among his own kind."

Oh, the human brain, what a phenomenon!

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The Education on Drugs of Health Care Profession Personnel and its Consequences for Drug Use

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Abstract

THE education on drugs of the health care profession personnel should contain a study of knowledge, a study of practice and a study of ethics in Pharmacy all based on drug-use control.

Introduction

Pharmacy Education

THE education on drugs of the health care personnel should be pharmacy and social pharmacy biased. By education here we mean "training them mentally and morally". The mention of drugs and education of people in that direction focuses an attention on the "Pharmacist".

The pharmacist is a health care professional who is an expert on drugs and how drugs act to fight disease and improve health. The pharmacist is knowledgeable about drug laws, assessment skills etc.

Before one becomes a pharmacist he/she would have obtained a formal "education" and "training" in designated pharmaceutical sciences, namely pharmacognosy (natural products) pharmaceuticals, in all aspects, pharmaceutical chemistry, pharmacology and forensic pharmacy (laws governing the supply, distribution etc. of drugs). These major fields of the study have their "flavours" added to them depending upon where you are and the pharmacy school you subscribe to. Similarly, the period of the education and training could also vary from 2 to 6 years, again depending upon where you are.

The education and training in

these disciplines are carried out in schools of pharmacy, colleges of pharmacy or universities of pharmacy: the training, the "practical training" is carried out in the actual set up where you practically put the acquired knowledge to the benefit of the society.

Staff:

There are qualified staff and personnel who conduct the education and training within the "set-ups" and in the various disciplines. Not all of them have the "pharmacy label" and some of them encounter difficulty in relating their efforts and contributions to the "mainstream effort" of the profession.

Real Scope of Pharmacy:

The "mission" of pharmacy has suffered because the responsibility for making medicines has passed to the pharmaceutical industry.

Despite this problem, we could still identify three bodies of the pharmacy profession, namely:—

- 1.0 A body of knowledge
- 2.0 A body of practice and
- 3.0 A body of ethics.

Even these aspects have also suffered as a result of the increase on the horizon of drug handling, drug use etc. which have widened and with it the people who are involved.

If the ultimate objective in the pharmaceutical service or efforts is to reside in the "health and safety of the patient", then certain welfare elements will have to come to term

with that pharmaceutical service.

The pharmaceutical service, by its nature is a service of clinically related control functions and the heart of these functions is the modern pharmacy function.

The pharmacist function must therefore account for the patient's "safety", as well as his "medication". One can then say that "DRUG-USE CONTROL" is the centre of the present day pharmaceutical service.

Scope:—

The spectrum of pharmaceutical function and practice has expanded to include:—

- the discovery
- the characterisation
- the synthesis
- the formulation
- the manufacture
- the control of quality
- the standardisation
- the sterilisation
- the compounding and
- the distribution of drug products
- the knowledge and understanding of the pharmacodynamics
- the mode of action
- the therapeutic usefulness
- the indications and contra-indications of use.
- toxicology
- the side effects of drugs
- the social implications of the use and the abuse of drugs and the legal factors governing their distributions etc.

There could be no end to the pharmaceutical function and as such the health profession team could be

extensive and to educate and train them to deliver the various functions could be enormous with rather unpleasant repercussions.

Pharmaceutical Dispensing:

Is a pharmaceutical dispensing the mainstream activity of the pharmacy service?

Should the health team personnel be educated and trained only in pharmaceuticals and dispensing?

The dispensing function of the pharmacist is important and vital for patient care but it's essentially a superficial practice of the profession which, by itself, does not utilise knowledge or skills sufficiently basic to merit professional recognition, to the depth of this function lies within the grasp of the hospital pharmacist.

If the dispensing function is not the core, then could DRUG-USE CONTROL be regarded as the mainstream function of pharmacy? Should the health team be educated and trained in drug-use control?

If yes, then we are considering education and training in:-

- 1.0 A body of practice and
- 2.0 A body of ethics as well as
- 3.0 A body of knowledge.

Drug-Use Control:

Let's define the drug-use control as "that system of knowledge, understanding, judgements, procedures, skills, controls, and ethics that ensures optimal safety in the distribution and use of medication". Such a definition could be said to relate the professional function to the patient welfare in the form of drug safety: it is patient oriented. If we could consider the drug-use control as the mainstream component of the pharmacy service, it should then apply to *Community Pharmacy practice* as well as *Institutional practice*. It should be applicable to *Industrial pharmacy*. (If we accept this, then the health team personnel to be trained is thus restricted to a great extent).

Into the mainstream should feed the efforts of:-

- 1.0 Pharmaceutical education
- 2.0 Pharmaceutical journalism
- 3.0 Pharmaceutical jurisprudence

The function of drug-use control should therefore be guarded by the pharmacist with a zeal. I mean with

the same zeal with which the physicians guard the patient-physician relationship; and lawyers with their client.

Within this concept standard practices of drug manufacture, promotion and distribution become deceitful practices inimical to public health and safety and those of us who become party to these acts are laid open as deliberate violations of pharmacist-patient trust.

Any attempt by a pharmacist to circumvent legal, professional or ethical procedures in the distribution of medication is to tamper with some of the underlying structures of good drug-use control, and thereby good pharmaceutical practice.

These could be hard to accept, but then we have to bear them in mind if we have to educate and probably train the other members of the health team to uphold the drug-use control concept. Let's also bear in mind that we as pharmacists are members of the health team and we cannot play or act in isolation.

Drug-use Control Legislation:

Every country has some form of legislation governing drug-use control to protect the citizens, the patient, etc. Similarly there are Boards and our various Pharmaceutical Societies which are responsible for the day to day administration of these legislation on behalf of governments through the ministry of health.

In most of these cases it's only the pharmacy student, the pharmacist who is exposed to such regulations and their scope of operation. Can he be or has he as a pharmacist been, successful in this task? No, and it is this state that has led to frustrations and abuses of the pharmacy profession and drug-use control. The drug-use control education system being proposed here is to enable the health profession personnel to be an immediate participant with the pharmacist in the drug-use control concept.

Team:

Who are the members of the health team or the health care profession personnel?

Why should they be "educated"?

Who are to tutor them?

What should go into the education programme of such personnel?

Why are they to be trained?

Are we diluting the pharmaceutical education by educating them?

Whose responsibility should the education and training be? etc.

The health care profession personnel would include:-

- the physician
- the pharmacist
- the administrator
- the technician
- the assistant
- the village health worker
- the storekeeper
- the medical teacher
- the nurses
- the midwives
- "the patient"? etc.

The health care profession is a mixed bag unlike the pharmacy student. The health care profession personnel will approach the education in "whatever" with diverse backgrounds, whatever be the case the education must follow a 'format' to which each school should add its own "flavours" depending upon the environment. We need "education system" or a "system of education" which should have relevant elements for the pharmaceutical sciences system of education.

Whatever the education system, it should embody the following:—

1. the basic knowledge of pharmacy
2. the basic practice of pharmacy
3. the ethics of pharmacy practice all with a strong bias towards drug-use control.

Such system of education should be dynamic, carried out within the hospital settings, 'the community settings' or the 'industrial setting, and each member of the health team is a real and vital link, to such system of education, so that it will enable each member of the team to contribute his/her maximal strength to the chain. If a break does occur at any point and for whatever reason, the drug-use control will be destroyed and the patient's welfare will be held in jeopardy.

The concept of drug-use control should be the central theme to provide the framework in which all educational effort of the health profession personnel should be channelled. After all, it is the Drug-use

control concept which is the key stone to the pharmaceutical service. It is that function which transcends all individual functions of pharmacy, yet it is the composite of all.

The drug-use control provides a purpose, it gives a direction, it recognises the need and the fulfillment in the patient-pharmacist relationship, it is the basic ingredient which underlies the essentiality of pharmacy and its service.

One is tempted to recommend short courses, programmes, seminars, workshops, etc. at regular times utilising real situations as an important fibre of the system of education being proposed.

Consequences:

With drug-use control as the basis one would expect the following:—

- 1.0 The "total" interest of the patient will be served by all concerned.
- 2.0 The dynamics of drug-use control will be real and will probably have less problems, less accidents etc. with drugs, drug-use, drug-abuse etc.
- 3.0 The pharmacist's role, work,

education and training will become real and a living, dynamic concept within the health team.

- 4.0 The health care profession personnel must be more dynamic in understanding the chain of service for which they exist, for the real service to the Society.

- (a) patient
 1. appropriate drug use
 2. monitoring
 3. compliance
- (b) inter-health professional
 1. economics
 2. availability of products
 3. comparisons
- (c) public

Additional Pharmacist Services

The pharmacist has other additional services.

- Contact the physician in cases of possible drug abuse or misuse.
- Contact the physician in cases of possible prescription errors.
- contact the physician regarding potential drug interactions.
- maintain patient-drug profiles.
- provide verbal instructions to patients as to how they should take their medication.
- inform patients about possible drug-related side effects.
- advise patients on non-prescription (OTC) medications, including recommending a particular product.

Appendix

Primary professional functions of the Pharmacist:

1. Drug procurements
 - (a) for individual pharmacy or system
 - (b) financial considerations, e.g. cost
 - (c) inventory management
 - (d) source
 - (e) quality control/assurance
2. Drug Distribution
 - (a) storage
 - (b) compounding
 - (c) dispensing
3. Drug prescribing
 - (a) Assist physician
4. Drug information/education



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