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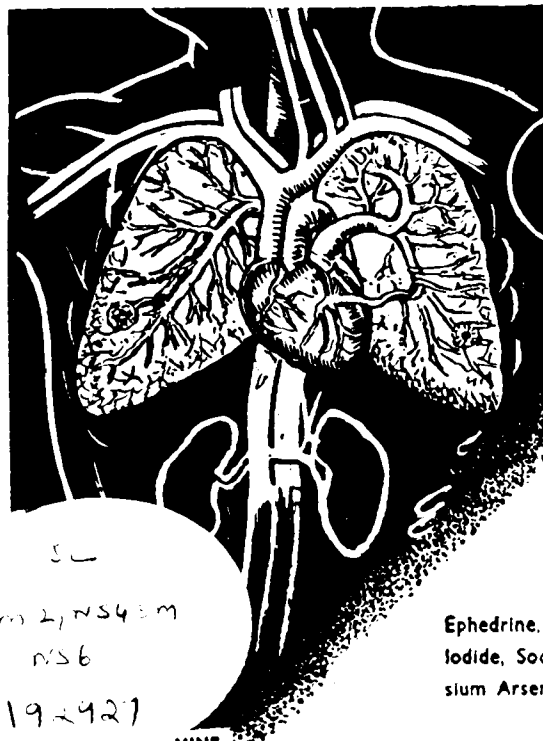
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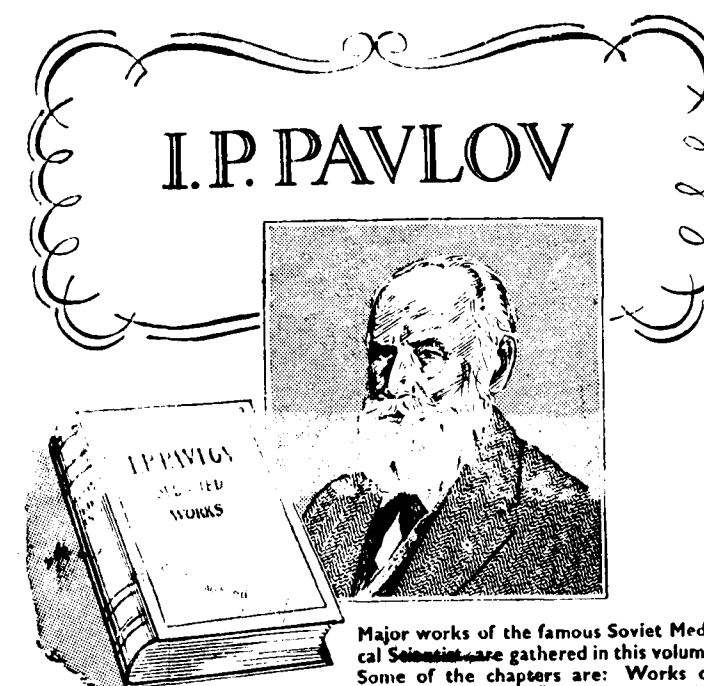
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SURGEONS IN THE MAKING

THE big surgeon was operating in a teaching hospital. The first operation was a hysterectomy and no difficulty was anticipated. His Registrar was assisting him. He had assisted for many years. Now he desired to perform the operation by himself under the supervision of his boss. Even if he summoned up enough courage to ask he knew he wouldn't be given the opportunity. The patient had already consulted the big surgeon outside privately. Naturally the patient wished to be operated on by that surgeon. The surgeon was in no mood to let anyone else perform the operation.

The Registrar had been at that hospital for several years. He had assisted the big surgeon at many operations. Except very occasionally he was given very little to do except for the routine so called "minor" operations which the surgeon was too busy to be bothered with and certain emergencies when the surgeon couldn't come. Indeed he could hardly recount an occasion when the surgeon let him perform a major operation assisting and instructing him at each step. So the Registrar was naturally a bit disgruntled.

The next case was a "laparotomy" for an abdominal tumour—almost certainly a straightforward medium sized ovarian cyst which had risen out of the pelvis. An abdominal exploration is always interesting. It is like opening a gift parcel, the contents of which are unknown. The Registrar's hands were itching to do this. He summoned up courage and decided to brave the surgeon's fury. "May I do this under your guidance and with your help?" The atmosphere was electric. The house surgeons and the students were watching. They looked shocked but secretly sympathized with the Registrar. The surgeon was taken aback. Then he exploded "You are inexperienced and when you are competent enough I will let you do it. Remember I am responsible for the patient's well-being." Noble words. Well said. The Registrar felt humiliated and wished he had never spoken.

The third operation for the morning was a vaginal repair for prolapse. The Registrar knew that he didn't need to ask for it because it would be thrust on him. This operation always bored the big surgeon. It was tedious and time consuming. Much of this type of surgery consisted of trimming and repairing. In his earlier days he had done a number of them to collect figures for a paper he was writing. Now he only did these on private patients but that too very grudgingly. Usually he left such operations to his Registrar who having had his fill of these was only too pleased to let the house surgeons toss up as to who should do it. The house surgeons loved doing this operation because it was one of the few occasions when they could use their hands and acquire some surgical skill.

The last few operations for the day were a string of "Dilatations and curettage"—either diagnostic or therapeutic. These the junior house surgeons invariably did on their own.

The big surgeon removed the ovarian cyst, closed the abdomen and went off to see a private patient in the town.

The operation list was completed and according to roster it was the big surgeon's duty day. That meant that in case of serious difficulty the Registrar was expected to let his boss know what was going on.

In the evening the surgeon called in to see his private patient (the one who had been operated on that morning). She was still a bit drowsy under the effects of Morphia but was fairing well. At 11 p.m. she complained of pain in the abdomen—such as many patients feel after an abdominal operation, because no operation is completely painless. The surgeon was informed and he came within half an hour to see the patient, comforted her, spoke reassuringly to her relatives and departed.

At 3 a.m. early the following day the Registrar was summoned to see the patient in the general ward who had had her ovarian cyst removed. She had been alright when he had seen her on his routine round late at night but now she was in a poor state. Her pulse was thready and rapid. She was breathing hard and fast. The Registrar diagnosed shock. The treatment of shock was first and foremost to restore the fluid volume. He obtained the surgeon's consent and assisted by house surgeons put up a blood transfusion. After a bottle or two had flowed rapidly the patient's general condition did not improve as much as might have been expected. He wondered whether perhaps there was more to it than mere post-operative shock. He thought it advisable to inform the surgeon and seek his advice. Hesitantly he disturbed the surgeon in his slumber. The reaction was immediate and unexpected. "Do you mean to tell me that with your experience you cannot supervise the post-operative care of a patient without bothering me? Yet you want to do operations in the theatre" he roared and slammed the telephone receiver on its hook. The Registrar hadn't the courage to ring him up again.

He went back to the patient. They gave her oxygen. They gave her more blood. She went downhill and at 5 a.m. she breathed her last. Blood from the abdominal wound was found soaking through the bandages. The Registrar was almost certain that a blood vessel had slipped its ligature and internal bleeding had killed the patient. He daren't say anything about it because only a post-mortem can prove with certainty. Bereaved relatives do not readily give consent to post-mortems. They are more upset about the loss of a mother or a wife than to wish to enlighten medical science.

Without this absolute proof to suggest that there might have been a failure of surgical technique would be to invite an instantaneous dismissal.

The surgeon was informed next day when he came to the hospital. He grumbled.

This is not the story of what happened in a particular hospital or how a particular surgeon behaved. Yet, it brings out certain facets in post-graduate training of surgeons in big teaching hospitals.

To allow surgeons private practice in teaching institutions has a detrimental effect. This is widely recognized and in the new institutes that are being set up private practice is being strictly prohibited. No one works without incentive. So instead of having to make money from private practice to fortify the astonishingly meagre salaries which are paid, surgeons and all staff working in such institutes should be very well paid. The considerations which should motivate the staff to work hard is to establish their institute as the best and to compete in turning out more useful work to advance scientific knowledge than other institutes. Another object should be to put out well trained and educated surgeons—not mere technicians. Such institutes should be asked to show every five years or so what they have accomplished to justify their existence. If they have accomplished very little an attempt should be made to find the reason for it.

Surgical training should be imparted to post-graduates in stages. They should not be looked upon as potential rivals who may one day make serious inroads into their own private practice. Nor should they, and there is a very real and unfortunate tendency to day for this—be treated as cheap medically trained labour to get essential investigations done in an inadequately staffed hospital. Much of the work they are made to do could be done equally well and with more competence and accuracy by a well trained technician. That they should know how these procedures are done there is no doubt but the object is not to use their time in doing this type of work—time spent more profitably in the examining room, the operation theatre, the pathology department or the library.

Post-graduates will naturally be of two sorts. There are those who show a leaning for purely academic type of work and those who wish to learn enough surgery and acquire sufficient skill which will stand them in good stead when they are called upon to man surgical centres in the hitherto un-doctored places. Those academically inclined should be given easy access to the wards and such facilities as they may require for their research. Those who wish to learn the practice of surgery should be made to do work under guidance and supervision and then allowed to bear considerable responsibility.

The Registrar in our story had assisted the big surgeon for several years. Yet rarely had he been taught what to do and made to do it under supervision. Of course by watching you can learn a great deal. Yet to watch all the time and never to use your hands makes them rusty. Only doing things gives surgical skill and it should be done when someone who knows how to do it properly and the dangers to avoid is watching and instructing.

The first patient was not available for training because she was a private patient. The second was not available because the big surgeon was a very impatient and selfish man. It was easier for him to do it by himself. It was quicker and he needn't worry at all later. It is very tedious to watch and instruct someone else. Unless the surgeon is a born teacher he will find it a great effort.

Vaginal operations in unskilled hands is as prone to dangers and to be followed by serious complications as abdominal surgery. The peritoneum may be opened or the bladder and even ureter may be inadvertently injured. Improper ligation of blood vessels may cause post-operative haemorrhage. A long time spent on these operations by amateurs increases the hazards of post-operative shock. Incorrect techniques in repair may will be followed by recurrence of the condition such as prolapse.

A simple “D & C”—and hundreds of these are done every week in big hospitals—performed without skill can lead to fatal consequences. The uterus may be perforated or the cervix may be torn. Malignant areas within the uterus may be overlooked by the casual curette. Injudicious curettage of an unhealthy uterus may provoke a fulminating attack of pelvic sepsis. Yet these operations are often left to juniors. Little if any instruction is given on the correct technique of doing dilatation and curettage and the precautions to be observed.

The surgeon in the story came readily to see his private patient. Yet he considered post-operative shock as a problem which could be safely left to his Registrar—the very person whom he wouldn’t trust to open an abdomen in his immediate presence!

Modern medical belief gives far greater importance to skilled pre-operative assessment, expert anæsthesia, meticulous attention and supervision in the post-operative period. Given these, it is claimed that even a surgeon with average ability may safely perform even major abdominal operations. The great importance of these factors which make surgery safe has yet to be recognized in our land.

Training in surgery should be in stages. The post-graduate has already completed a general training. He has been interned in a hospital for a year. There should be enough senior staff to take an individual interest in his welfare and teach him how to do things for himself.

Unless this is done, the surgeons we shall send to man the medical centres in hitherto un-doctored territories will be half trained. The standard of surgery they practice will be deplorable. They may talk big about Wertheim’s operations and difficult forceps deliveries which they might have witnessed but the actual contribution which they make will bear no relation to the cost of providing them with an expensive post-graduate education.

Surgery today has ceased to be the monopoly of the chosen few. In teaching institutions decent salaries should be paid and private practice should be strictly forbidden.

Unless such institutions aim at producing trained and educated surgeons and to conduct research to advance medical knowledge, big so called “teaching institutions” will turn into private reserves for a few surgeons with little interest in the academic aspects of surgery and anxious to make big private fortunes.

A SURVEY OF CASES OF COMA

BY DR. G. V. SATYANARAYANAMURTHI, M. D.
Professor of Medicine, Andhra Medical College, and Physician, King George Hospital, Visakhapatnam
AND

DR. T. SRINIVASAN, M. B., B. S.

A case of coma must be deemed as a medical emergency. As coma may be due to variable causes, diagnosis becomes a matter of great importance with reference to specific treatment. But whether diagnosis can be made forthwith or must await investigation, treatment is of prime importance to keep the patient alive, whatever the ætiology may turn out to be subsequently. It is therefore thought desirable to survey the cases of coma that were admitted into the wards of the Senior author during the five year period from 1950 - 1954 in the King George Hospital, Visakhapatnam.

Out of a total of 8700 admissions, 155 cases of coma occurred giving a percentage of 1.76. Of these 99 cases are males and 56 are females showing a slight preponderance of this condition in the male sex.

The age distribution is as follows :

AGE DISTRIBUTION		
	Years	Cases
Children	0—6	37
	7—12	10
Adults	13—20	26
	21—30	38
	31—40	24
	41—50	9
	51—60	6
	More than 60	5

I. ÆTIOLOGICAL DIAGNOSIS OF COMA

A study of the ætiology of the above cases as shown in the following tabular form reveals that nearly 1/3 of the cases are due to infection, while about 1/6th are due to cardiovascular accidents and about 1/10th are due to metabolic conditions and an equal number to neurological causes.

Aetiology	No. of cases	% Incidence
1. Cardiovascular and cerebrovascular accidents	25	16%
a. Embolism	1	
b. Thrombosis	5	
c. Hæmorrhage	15	
d. Hypertensive encephalopathy	2	
e. Syncope	2	
2. Infective and inflammatory conditions	56	23%
a. Encephalitis	12	
b. Meningitis	30	
c. Cerebral malaria	13	
d. Cerebral abscess	1	
3. Metabolic and constitutional diseases	16	10%
a. Uræmia	6	
b. Diabetic coma	4	
c. Hepatic coma (cholemia)	6	
4. Poisons and noxious agents	7	5%
a. Opium	3	
b. Barbiturate	1	
c. Alcohol	1	
d. Phenyl	1	
e. Eucalyptus oil	1	
5. Intracranial tumour	1	
6. Physical factors	6	5%
a. Heat stroke	2	
b. Sun stroke	1	
c. Electric shock	3	
7. Post-epileptic state	18	12%
8. Psychoneurosis and hysteria	8	5%
9. Miscellaneous	21	
Cholera (Coma vigil)	7	
Moribund state	7	
Drowning	4	

II. COMA IN CHILDREN

Out of the 47 cases of coma that occurred in the age period below 12 years, 29 or about 70% are due to infections as shown in the following tabular form. This reveals that while cerebral accidents contribute more towards coma in adults, infection does so predominantly in children.

	Below 12 years	Between 13—40 years	Above 40 years
Cardiovascular and cerebral accidents	—	6	19
Infective	29	24	3
Metabolic	3	8	4

PROGNOSIS

Out of the 155 cases reviewed, 58 recovered, 90 died and 7 were discharged against medical advice. Out of the 43 cases of coma due to poisoning, physical factors, epilepsy, psychoneurosis and drowning, 38 cases recovered thereby illustrating that these categories of cases have the best prognosis depending on suitable treatment.

Out of the 25 cases of cerebrovascular and cardiovascular accidents only 4 have recovered and these belong to the syncopal attacks and hypertensive encephalopathy. Out of the infective causes 16 recovered out of the 56 admitted; and out of these 6 are cases of cerebral malaria, and 10 are cases of meningitis and encephalitis. From the metabolic group, only 2 recovered and these are cases of diabetic coma which has the best prognosis of the metabolic conditions.

CASES EXPIRED

Out of the 90 that expired, nearly 54 cases died on the very first day of admission, namely within few minutes to few hours of admission. These were evidently brought in a moribund state, the patients having been in the comatose state for a long time when irreversible changes have set in thereby proving that any measures of treatment that may be adopted in these cases are of little avail.

Cases Expired	No. Admit- ted.	No. Ex- pired.	Per- centage
Cerebrovascular and cardio-vascular accidents	25	19	76
Infective	56	37	74
Metabolic	16	12	75
Poisons	7	1	14
Physical factors	6	1	17
Post-epileptic state	18	3	17
Miscellaneous	21	17	86

As mentioned at the outset, a case of coma may be due to a variety of causes and is often a terminal phase in almost any disease and hence for diagnosis and treatment purposes we can broadly divide the cases as:—

1. Cases in whom coma is an early prominent feature
2. Cases in whom coma is a late and subsidiary event.

Attention has to be drawn to the cases of "Group 1" as it is herein we have hope of reviving the patient if the accurate diagnosis and treatment are meted out to the patient early.

DIAGNOSIS AND TREATMENT

As already mentioned one should first resort to life saving measures, to abate obvious haemorrhagic shock, and to provide a patent air way before proceeding to examine a patient more scrupulously.

History is often rewarding only if available, when the best use of it has to be made. Evidence in such cases regarding drugging, treatment for heart disease, incidence of epileptic fits etc. will be forthcoming to set a necessary background for diagnosis.

Age of the patient keeps us aware of certain conditions that can be thought of as is mentioned previously.

Clear observations regarding the colour of the skin, smell of the breath have to be made. The smell of alcohol and acetone, the rancid odour of opium will give easily a clue to the diagnosis. The appearance of peripheral shock due to haemorrhage is quite obvious. Peripheral haemorrhagic spots in the conjunctivæ and nail beds are often due to embolic phenomena.

Head injuries which often go to the surgical side can be suspected if there is a contusion or laceration of the

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The type of respiration also has got much bearing on the causation of the coma. The slow and deep respiration (Kussmaul's) is characteristic of diabetic acidosis. In pulmonary oedema it is rapid, laboured and noisy, in morphine poisoning it is slow, deep and depressed, so too in raised intracranial tension. Cheyne-Stokes breathing (periods of apnoea alternating with hyperpnoea) is often seen in uræmia, heat stroke and occasionally in increased intracranial tension.

Examination of the eyes is of supreme importance as it is a window through which the depths of brain can be visualised and ravages of a systemic disease realised. Ophthalmoscopy reveals the characteristic changes in fundus seen in diabetes, hypertension and space occupying lesion in the cranial cavity.

The pupils, size and shape have significance. In alcoholism, barbiturate and belladonna poisoning, they will be dilated and they will be small and contracted in opium poisoning and pontine haemorrhage. Unilateral change in size reveals unilateral intracranial lesion and sympathetic involvement. The displacement of the eyes namely conjugate deviation throws light on the intracranial lesion.

Mouth examination for staining of the gums and corrosions is of importance in arriving at the offending drug or agent.

A detailed examination of the central nervous system is highly essential as it will often yield a localising sign pointing to a cerebral mischief.

Examination of the cardiovascular system has to be next followed. The pulse is counted and B. P. recorded. Abdominal examination for any acute abdominal catastrophe should be carefully done. After history taking and physical examination are over, steps should be taken for doing certain investigations.

1. Gastric lavage is done in all suspected cases of poisoning both for diagnosis and treatment.
2. Examination of catheterised urine for sugar, acetone and albumin.
3. Blood counts

4. Blood smear for malarial parasites
5. Lumbar puncture to see for its nature, pressure and cytology of fluid and biochemical analysis and bacteriological examination.
6. Blood biochemistry
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8. E. C. G. for coronary thrombosis, Stoke Adams syndrome.

TREATMENT

The sine qua non of all measures of treatment is to salvage the vital centres which are in the grip of being depressed and the next step is to resort to administer specific remedies that are available which again depend on an accurate diagnosis.

Feeding: Care and precaution should be evinced in feeding a case of coma for more often the fluids may be aspirated into the trachea exposing the patient to a grave risk of suffocation and aspiration pneumonia. Ryle's tube should be carefully passed into the stomach and making it doubly sure that it is in the stomach, that feeding by way of the tube should be started. If this is not possible infusions can be given to supply the fluid and electrolytes.

Bed Sores: are a menace in a cases of coma which are in a comatose state for a number of days. A suitable mattress with frequent attention to the back of the patient and alteration of his position now and then will go a long way in obviating this complication.

Cerebrovascular lesions (haemorrhage, thrombosis and embolism) demand a close observation aided by nursing care and supportive measures. Sedation needs lot of judgement of the case in question. Surgically approachable lesions can be dealt with only by surgery such as trephining in a case of subdural haematoma etc. Subarachnoid haemorrhage should be watched and if increased intracranial pressure is imminent, lumbar puncture should be done. Haemorrhagic shock needs first resuscitation of the patient. Then haemostasis is attempted at if the bleeding site is visible. An internal haemorrhage also demands early restoration of fluid balance. Sometimes it may get arrested or else it requires surgical intervention despite the poor condition of the patient.

Syncopal attacks are often self-curing. The underlying heart disease can be tackled on the respective involvement of the cardiovascular system.

Infective causes in general need supportive measures and then massive doses of suitable antibiotics and chemotherapeutics. In cases of cerebral malaria, quinine hydrochloride parenterally given along with glucose saline for the dehydration will rally round remarkably most of the cases.

Metabolic causes: Uræmia as a terminal event portends calamity and treatment is far from satisfactory. Anyway attempts at restoring the dehydration by infusions and by repeated lumbar puncture to relieve the raised intracranial pressure may reward the efforts suitably. Electrolyte balance has to be aimed at by assessing the condition by way of the biochemical investigations. Improvisation of an artificial kidney (Haemodialyses) has lot of promise in reviving patients back into consciousness.

Diabetic Coma: Attempt at controlling the ketosis and making it disappear from circulation will bring back the patient to senses. Insulin treatment supported by electrolyte restoration is the only step to dispel the ketosis. Fructose administration in place of glucose has many advantages to choose: it is less diuretic in its action, reduces ketone bodies production without increasing hyperglycæmia or glycosuria and in cases of insulin resistant patients it is specially invited.

Hypoglycæmic shock requires parenteral glucose.

Cholæmia again is of grave prognosis; fluid replacement with supplementaries like vitamins, antibiotics and timely transfusion of whole blood can be tried. In this direction adrenal cortical hormones may offer a hope.

Heat stroke warrants immediate measures to lower the temperature by hypothermic agents such as ice water, immersion or enemata, repeated sponging with alcohol (70 %).

Heat exhaustion needs infusions, transfusion of blood or plasma.

Electric shock and drowning need urgent artificial respiration.

Poisoning requires immediate gastric lavage with suitable antidotes, analeptics and artificial respiration if the patient is in danger of respiratory depression. Many a case needs an Iron lung for prolonged time to rally round.

Post convulsive states (epilepsy, toxæmia) need sedation.

Psychoneurosis, hysterical causes of coma are best left to themselves attention being paid to by way of non-specific measures.

SUMMARY

A brief survey into the cases of coma is made. The incidence with respect to ætiological causation, age distribution has been discussed. The prognosis of each case is brought out.

The diagnostic measures with a brief sketch of signs and symptoms have been pointed out.

The treatment of each case has been mentioned in a brief manner.

A youthful British officer, wishing to ingratiate himself with a cantankerous old brigadier general, approached the grumpy one day in his club. "A good morning to you, General," he said saluting.

"Grumpff" mumbled the old fellow,

"General, I hope you will pardon the injection of a personal word, but I did read the death of your wife and I wish to extend my condolences."

"The General Adjusted his monocle, stared at the young man a few minutes and then grudgingly muttered, "Wife? Oh, yes, yes. Buried her yesterday. Had to, y'know. She was dead."

ing test is undertaken. The test aims at finding out which of the antibiotics is most effective against the particular organism or organisms responsible for the infection.

Any well equipped clinical laboratory can undertake this test. After the initial isolation of the micro-flora from clinical materials, these are cultured individually on petri dishes containing selective culture media. Sterile filter paper discs, 5 mm. diameter, impregnated with minute amounts of the different antibiotics are placed on different marked out sectors of the plate. After overnight incubation, zones of clearings or inhibition appear around the discs which contain the effective antibiotics, the diameter of the zone is directly proportional to the degree of activity. Today a large number of antibiotics claim activity against a particular micro-organism. A screening test can possibly help to select out the best amongst them for any particular micro-organism, sometimes the same bacteria may be highly sensitive to one and resistant to another. For instance a large number of antibiotics, including those belonging to the broad spectrum group possesses activity on the gram positive cocci, penicillin is usually prescribed for infections caused by these organisms, yet such a test may reveal that for a particular strain bacitracin, erythromycin or perhaps some of the broad spectrum antibiotic would prove more effective.

Antibiotic therapy presents other problems too. In the treatment of conditions of meningeal involvement it should be ascertained whether the antibiotic passes the blood brain barrier and whether the infecting organism has been identified. If gram positive organisms, streptococci, staphylococci or pneumococci or gram negative meningo cocci are found to be responsible for the condition, penicillin perhaps would be the drug of choice. If on the other hand the meningitis is a typical and caused by some such organism as the H. influenza or Klebsiella pneumoniae, oxytetracycline or chlortetracycline should be preferred to penicillin.

In infections caused by corynebacterium diphtheriae, penicillin is usually prescribed, it is however evident from recent experiences that erythromycin is also a drug of great promise for the treatment of such conditions.

For the treatment of whooping cough besides chloramphenicol, chlortetracycline, oxytetracycline and erythromycin are also antibiotics which can be successfully used for controlling infections caused by H. pertussis.

In the treatment of urinary tract infections, the choice of antibiotic has to be made after ascertaining the nature

of the infecting organism. Infections caused by the gram positive organisms respond to penicillin, but when gram negative bacilli are responsible for the condition some of the other antibiotics should be considered. Infections caused by Esch. coli, aerobact, aerogenes, proteus vulgaris, or alkaligens, faecalis fail to respond to penicillin therapy, such conditions should be treated with streptomycin, chlortetracycline, chloramphenicol or oxytetracycline. With streptomycin the chances of development of resistance should always be remembered and in the event of such taking place, some other antibiotic should be chosen. Tetracycline, which is the common chemical moiety of chlortetracycline and oxytetracycline will perhaps be the best drug for the treatment of these infections. It is also the least toxic one of the broad spectrum group.

In infections of the intestinal tract caused by the gram negative bacilli belonging to the shigella or the salmonella group, any one of the broad spectrum antibiotics should prove effective. However if staphylococci or enterococci are considered as responsible for the condition, erythromycin should be advised.

In enteritis of the new born and the infants where the etiologic factor is found to be Esch. coli, chlortetracycline or oxytetracycline have been found to bring about the best clinical response.

In amoebiasis, although chlortetracycline and oxytetracycline are usually favoured, bacitracin has also proved to be very effective in a large number of cases.

As has been mentioned before development of resistance by micro-organism to any antibiotic also presents problems for antibiotic therapy. The serious implications that might follow needs appreciation at the present time to avert future crisis.

It has been noted in 'in vitro' studies that prolonged contact with an antibiotic fails to bring about development of resistance in an organism if the doses of the antibiotic are sub-effective. Clinically however a sub-effective dose is useless, hence attempts were made to widen the field of activity by combining two antibiotics in sub-therapeutic doses. In some cases such combinations have proved useful and it has been possible to get effective clinical response by the simultaneous administration of two antibiotics in smaller doses. Such combinations sometimes act because the two doses in combination gives a complete dose, this we describe as an additive effect, in some cases the combinations prove more effective than an individual full dose, this is labelled

as synergistic response. In combination therapy synergistic action is always preferable to additive action.

The synergistic effect of combination of two antibiotics or combination of an antibiotic with a chemotherapeutic agent has been fairly well noted in modern therapy.

Whereas penicillin or streptomycin singly fails to control sub-acute bacterial endocarditis, a combined therapy with 10 million units of penicillin and 2 gms. of streptomycin results in almost 100 per cent cures.

In staphylococcal endocarditis, a combination of streptomycin and chlortetracycline produces a far better response than either drug alone.

In infections caused by pyogenic organisms where penicillin alone fails, combinations with bacitracin, erythromycin or carbomycin may bring about a dramatic change in the clinical picture.

In meningitis following infection by Diplococcus pneumoniae or Hemophilus influenza, antibiotics alone may fail. In such cases a combined therapy with sulfa drugs proves effective in controlling the infection.

The most interesting feature with combined therapy is perhaps evidenced in the treatment of tubercular infections. Clinicians are aware that Myco. tuberculosis develops resistance to streptomycin and dihydrostreptomycin sometimes even during the course of treatment. This unhappy state of affairs can perhaps be averted if the antibiotic is used together with some of the new anti-tubercular chemotherapeutic preparations. Smaller doses of streptomycin in conjunction with either p. aminosalicylic acid (P.A.S.) or isoniazid not only brings about a better clinical response, this to a large extent helps in preventing the development of resistance by the organism to streptomycin, thus enabling the antibiotic to continue exerting its antibacterial effect.

In amoebiasis too, although chlortetracycline and oxytetracycline are quite effective in aborting an acute infection, they have not proved very successful in preventing relapses or in the treatment of carriers. Emetine, carbarsone or chlorquin-di-phosphate together with one of the above antibiotics can again better control such conditions.

In certain clinical conditions, during administration of antibiotics, some other supportive therapy becomes

sometimes necessary. In treating conditions where an infective micro-organism liberates some form of an exotoxin, antibiotics alone cannot clear up the clinical picture. In diphtheria and gas gangrene, although effective antibiotics are available, reliance should not be placed on these agents alone, the antitoxic sera that are available for the treatment of these diseases should always be given to support the antibiotic therapy. Antibiotics are mere bacteriostatic or bactericidal agents, they have however no power to neutralize the liberated toxins, anti-toxins only can counteract such toxins.

The relapse rate in chloramphenicol treated typhoid cases likewise can be brought down if small doses of typhoid vaccine are given during antibiotic therapy. The vaccine stimulates production of antibodies which are necessary to curb down the flaring up of any residual infection.

According to some, in the treatment of tubercular infections, carefully controlled doses of tuberculin helps streptomycin, p-aminosalicylic acid or isoniazid to exert better bacteriostatic or bactericidal effect; perhaps the mild focal reaction exposes the deeply lodged organisms to come in contact with these anti-tubercular agents.

It will perhaps be worth while to try supportive vaccine therapy to treat sub-acute or chronic infections while antibiotics are administered.

Penicillin till recently was given exclusively parenterally. The recent introduction of oral preparations, tablets and syrups has made penicillin therapy easy. It must however be remembered that to have an effective blood concentration level much more penicillin by mouth would be necessary than that which would have been adequate if it was administered parenterally, and certain directions have to be given to patients when oral therapy is undertaken. Oral preparations should always be taken during mid-meal times i. e. one-half hour before or two hours after meals. The total dose should on an average be five times the dose that would otherwise have been indicated for parenteral therapy.

Of the different repository penicillin preparations, it may be interesting to note that in N, N'-dibenzylethylenediamine dipenicillin (DBED) we have today a very 'stable' and a 'long action' preparation. A single injection of 600,000 units in ambulatory adults produces and maintains sufficient blood concentration for 10-14 days, and in children, 1,250,000 units can bring about similar condition for a period of four weeks.

The broad spectrum antibiotics are usually prescribed for oral administration, however for conditions where this form of therapy is not possible, special preparations are available for intravenous medication. As most of these intravenous preparations tend to cause phlebitis, suitable diluents like sodium glycinate, leucine or glycine are provided in the packings, and it is recommended that these should be used with sterile distilled water, saline or glucose solution when injections are prepared for medication. Intravenous therapy should be withdrawn immediately the patient is in a position to take the oral preparation.

Antibiotic therapy at times by suppressing the pathogenic flora may encourage the implantation of certain others; these are usually non-pathogenic, yet in some cases they have unfortunately proved harmful to the host. Yeasts and monilia are some of the organisms that gain upper hand during antibiotic therapy. Particularly during therapy with chloramphenicol, chlortetracycline or oxytetracycline, such micro-organisms get implanted in the intestines. In certain cases this results in diarrhoeas or soft stools, in others

there may be more serious symptoms. The normal flora of the intestines are agents that help in the synthesis of some of the essential vitamins, withdrawal of this flora may bring about an insipient condition of avitaminosis. Supportive vitamin therapy is sometimes necessary during the administration of such antibiotics. The condition fortunately clears up after withdrawal of the antibiotic.

Although antibiotics have revolutionized treatment of many infective conditions, there are many illnesses for which effective antibiotics are not yet available. Leprosy and cholera are two of the outstanding bacterial infections where antibiotics fail to act. No antibiotics have been found potent against the smaller viruses. Fortunately the hunt for new antibiotics still continue, and time is probably not far remote when effective agents to control these infections will be made available. Two new products, Actinomycin and Sarkomycin predict even brighter future for therapy of malignant growths, these two antibiotics have been found to possess cytostatic action, may be in them we will have the solution of a problem that has perplexed the medical world so long.

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AMOEBIC DYSENTERY AND ITS MANAGEMENT

By DR. L. K. GANGULI, B. Sc., M. D., M. R. C. P.

Hony. Visiting Physician, Nilratan Sircar Medical College and Hospitals
and
Hony. Cardiologist, Islamia Hospital, Calcutta.

INVOLVEMENT of the large intestine producing dysenteric signs and symptoms by the protozoa *Entamoeba histolytica*, is known as amœbic dysentery or intestinal amœbiasis. The recent terminology 'Amœbiasis', includes not only the involvement of the large intestine but involvement of other organs of the body. Whatever may be the other sites of involvement, the seat of the primary infection is always the large intestine.

Differentiation of dysenteries before 1875 was not possible. It was Losch (1875) who first reported the findings of amœbiæ in the stools of dysenteric patients. That *Entamoeba histolytica* is the causative organism was first pointed out by Schaudin (1903). He also differentiated the pathogenic form from the harmless amœbæ. During the World War I Dobell (1917) and other workers made extensive studies in the nature and pathogenicity of *E. histolytica*.

DISTRIBUTION

Amœbic dysentery is prevalent as a major bowel disease in the tropical and sub-tropical countries. In U.S.A. 10 per cent are infected with amœbæ (Anderson 1953). In Bombay it varies from 43.3 per cent (Patel 1945) to 20.1 per cent (Shrivastava, 1953). In Madras the incidence is 38.3 per cent (Govinda Reddy and Tangavelu 1946). In Calcutta according to Chaudhuri and Rai Chaudhuri (1946) the incidence was 8.8 per cent in a series of 9015 patients. The over all incidence in West Bengal is about 30 per cent.

THE NATURE OF E. HISTOLYTICA

E. histolytica exists in two forms : as trophozoites or vegetative form and cystic form.

The vegetative form is active and in living condition it measures about 20–30, about three times the diameter of a R. B. C. It is transparent with a fine granular endoplasm and a thin ectoplasm. In the endoplasm are embedded the round nucleus and vacuoles. Occasionally ingested red blood cells may also be found. The shape is ever changing and the locomotion is effected by means of pseudopodia.

The cyst is the inactive form. When the environment becomes unsuitable for the vegetative form to exist as a trophozoite, a precystic stage develops, followed by cyst formation. The cyst is round and is provided with a tough ectoplasm, which keeps them viable for a long period. It also affords protection when they are in contact with chlorinated water or sewage. Dessication is harmful for the cysts. *E. histolytica* cysts are best seen and identified when stained with iodine solution. There may be two or four nuclei and more than one chromidial bars.

EPIDEMIOLOGY

Amœbic dysentery is frequently found to be common in families and dormitories. In India about 30 per cent are cyst passers. It was Darling (1913) who proved that only the cysts are infective and the route of infection is via the mouth. Sewage polluted water, food handled by cyst passers and the house flies are the common and main factors in the spread of the disease. Ingestion of unwashed fruits and raw vegetables particularly where human excreta has been used as a fertiliser is also a causative factor.

In India 90 per cent of food stuffs are prepared and distributed by hand and thus cysts may be passed via the soiled fingers. The habit of keeping the food uncovered, dirty eating houses and absence of proper sense of cleanliness of surroundings invite flies and thus help the spread of the disease.

PATHOLOGY

The large intestine extends from the caecum to the rectum and measures about 1.82 metres. The initial lesion first starts in the cæcal region and then spreads to the other part of the large intestine. The amœba first invades the submucosa and multiply there. Inflammation sets in with formation of small abscess which bursts out through the mucousmembrane to form ulcers. The acute ulcers appear as small discrete yellowish elevations on the mucousmembrane with hyperæmic zone round each. The size of the ulcer varies from a pinhead to 2.5 cms. in diameter. In severe acute infections sloughing and gangrene may also develop. In chronic and late stages of amœbic dysentery the ulcers have a punched out appearance. The edges are under mined due to the necrosis

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Recently broad spectrum antibiotics have been tried in the treatment of acute amœbic dysentery. Of all these oxytetracycline has been claimed to have the most effect. Heavy doses of vitamin B complex must be given during treatment with broad spectrum antibiotics.

Relapses—The acute symptoms should be controlled by few injections of emetine (Chaudhuri 1947). It should then be followed by emetine bismuth iodide and carbarsone for 10 days along with chinofon retention enema. Manson Bhar (1954) recommends combined treatment of chinofon retention enema in the day with emetine bismuth iodide (3 gr.) at bed time for 10 days. Emetine bismuth iodide is less active than arsenicals and oxyquinolines, and the toxicity is same as that of emetine. As it is administered orally, nausea and vomiting are quite common. This is prevented by administration of phenobarbitone 1 gr. $\frac{1}{2}$ hour before E.B.I. Chinofon acts both against vegetative and cystic forms. It is a safe drug and acts both in acute and chronic stages. Oral administration is not recommended.

Chronic amœbic dysentery—Emetine has no action on the cystic stage of the amœba. Moreover amœbicidal drugs do not act effectively in the presence of secondary infection. Both these, that is presence of cysts and secondary infection are the main features of the chronic stage. Administration of emetine is best avoided if vegetative forms are not present in the stools. Best results have been obtained by a combined treatment with penicillin and sulphathiazole, both continued for 7 days, followed by E. B. I. in capsules after meals at bed time for 12 days followed by either carbarsone or iodochloroxyquinoline for 15 days. (vide Table 1)

TABLE 1

Other drugs used in the treatment of chronic intestinal amœbiasis are :

1. Combined bismuth derivative with pentavalent arsenic. This drug is being preferred by some in place of carbarsone, because it is less soluble and less toxic and at the same time quite active in emetine resistant cases.

A gambler and his wife, married ten years, suddenly were visited by a cyclone. It ripped the roof off, picked them into the air, twin beds and all, and set them down a mile from the spot. The husband seeing his wife sobbing, said "Don't cry dear. You are safe." She moaned, "I'm crying because I'm so happy. You see, it's the first time we've been out together in ten years."

2. Diiodohydroxyquinoline. The action is similar to iodochlorhydroxyquinoline group of drugs. It is not very active against vegetative forms, but a drug of choice is symptomless cyst passers.

3. Chloroquine. It is poorly effective in intestinal amœbiasis, but remarkable effect has been reported in the treatment of amœboma (Chakravarty 1954). It is a drug of choice in hepatic amœbiasis.

4. Combinations of chloroquine, iodochlorhydroxyquinoline and arsenicals are being used with good results in the treatment of chronic intestinal amœbiasis.

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The Application of the 'THEORY OF CONDITIONED REFLEXES' to Medicine

And Other Allied Sciences

BY DR. R. K. PAL, D. Sc. (Edin.); M. Sc., M. B. (Cal.) : M. R. C. P. ; F. R. S. E.

Professor of Physiology, R. G. Kar Medical College, Calcutta.

IN July last I have had the pleasure and privilege of visiting the great Pavlov Institute of Leningrad as a delegate to the Atomic Energy Conference held at Moscow. It was a sort of pilgrimage so to say, to the place where the great Russian Scientist lived and worked for more than half a century, irrespective of the fall of the Czarist Empire and establishment of the Supreme Soviet Republic through bloody revolutions. There some forty five to fifty years ago he laid the foundation of the 'Theory of Conditioned Reflex' which has opened up an entirely new field in Physiology with far reaching effects pervading pathology, psychology Medicine, Midwifery and even beyond the range of Medical Sciences, dairy, and animal-husbandary, whereby milk production and egg-laying capacities have been improved in the domestic animals and birds respectively and sometimes noticeable changes in their familial characters for some generations if not permanently.

Although 20 years have passed since the death of this great savant, the work so well begun by him is not only vigorously continued but also has been expanded by his students and colleagues like, Orbeli, Bykov, Baranov, Petrova and many others.

The greatest achievement so far obtained is in its practical application in Midwifery in what is known as 'Painless Child birth'. During the entire period of constant and vigilant ante-natal care a condition is created in the higher nervous system of the expectant mother with a belief that pregnancy and child birth are nothing but physiological processes like eating and drinking ending with defecation and micturition respectively and if normally developed should not involve any suffering, which helps them to overcome the age-old fear of it. A mental training of this kind if properly given makes the would-be mother calm during her confinement, with a conscious approach to it. Of course occasionally X-ray skiagrams are taken to determine the exact position of the unborn infant and any abnormality noticed is corrected immediately and very rarely a pain relieving injection is given only to one or other hypersensitive patient. Thus during delivery pains are much alleviated or completely eliminated.

The causes of functional disturbances of the higher Nervous System such as neurosis, hysteria, schiziphenia etc. have been thoroughly investigated by Pavlov and his co-workers by this method and based upon the definite observations they strove to build up an experimental therapy of these disorders consistent with the pathogenesis, so that the functional pathological state of the cerebral cortex was brought closer to the field of pharmacology of the higher nervous activity.

Immediately before his death, on the basis of his close observations for half a century, Pavlov classified animal and human higher nervous activity into well defined types drawing a parallel between these types and classification of temperament by the ancient Greek Scientist Hippocrates. They are the following : (1) Strong but unequilibrated or *Impetuous* type (where the excitatory process prevails over the inhibitory ones), analogous to the 'Choleric' temperament of Hippocrates, (2) Strong and equilibrated that is *Quiet or Slothful* type with 'phlegmatic' temperament, (3) Strong, quite equilibrated but at the same time *labile* with 'Sanguine' temperament and lastly (4) the *Weak* type with susceptibility to inhibition, having a 'Melancholic' temperament. Nevertheless all the types are equally liable to a constant and pronounced susceptibility to inhibition. Human beings, he further divides into two distinct groups, (a) Artists and (b) Thinkers, the first including writers, painters, musicians and others, perceiving reality as a whole, without breaking or decomposing it while the second, such as the scientists, philosophers, judges and the like, on the contrary, dismember first and then assemble to revive it, which in many instances, unfortunately they cannot accomplish. In the former group there is the predominance of the primitive or the first signalling System, comprising of different recepto mechanisms in response to different stimuli, conducted to the corresponding cells of the C.N.S. while in the latter 'Signalling System' of the Second order comprising of the signals of the initial signals in the shape of speech-spoken, auditory and visual is the dominating factor. A general disequilibrium of the nervous system with derangement of dynamic correlation between the two systems affecting the sub-cortical and cortical activities respectively in the first

spreading sidewise. The ulcers are discrete and the intervening mucsmbrane is healthy and normal. The ulcer extend in the deeper layers and inflammation spreads to the bowel wall resulting in local hypertrophy. Added œdema helps in the thickening and palpability of the bowel wall.

SYMPTOMATOLOGY

The disease affects all ages but the maximum incidence is between 20-40 years. Residents of colder climate while staying in tropical zones are more severely affected than the local inhabitants. Chronic cases flare up whenever a break down of health occurs due to other diseases or due to lack of nutritious diet. The lesions of the large intestine being variable, the symptomatology are also variable. However the patients may be classed into three groups as follows :

1. *Acute primary amœbic dysentery* — A few only gets such an attack. There is sudden onset of diarrhœa, the number of stools vary from 10-14 times a day. The stools contain fœcal matter and mucus, mixed with pus and blood. There is very little pain during defœcation, but pain of griping nature is felt round the umbilicus and in the illiac fossæ. The abdomen is usually tender, but no rigidity is present. High fever and severe upper abdominal tenderness when present, means spread of the infection upto the liver. Tiredness, lassitude and anorexia are also present.

2. *Amœbic diarrhœa*—Majority of the people suffer from amœbic diarrhœa. Some and all the features described above may be present, but the severity is always less. There is sudden diarrhœa without any obvious cause.

3. *Chronic amœbic dysentery*—Usually after the acute attack is over a reinfection may occur or the acute attack instead of healing completely gradually passes into a chronic stage. The symptoms of chronic amœbiasis are so varied that they may mislead the unwary into a wrong diagnosis. Occasionally there is a period of well being and the stools become normal. Sometimes there is sudden passage of loose stools along with mucus and blood, or the patient may suffer from alternate diarrhœa and constipation. Pain around the umbilicus relieved immediately after a passage of stool is characteristic. Apart from the intestinal complaints a patient suffering from chronic amœbic dysentery may present himself for acidity, heart burn, anorexia, indigestion, palpitation, loss of weight, anœmia and various allergic conditions of the skin.

Low backache and a typical joint pains are also usually due to chronic intestinal amœbiasis. Headache and neurasthania are common features.

COMPLICATIONS

Hepatitis though a complication, may be found as a concomittent phenomenon in nearly all severe and chronic amœbic dysentery. Sometimes it is the liver involvement which draws one's attention to the bowel. Of all the intestinal complications amœbic granuloma requires special notice. In older persons this condition often resembles carcinoma of the colon. Typhlitis, appendicitis and gangrene of the intestine may occur. Extra intestinal complications are—Abscess of the liver, lung and rarely brain, involvement of the skin, neurasthenia and long continued ill health.

MANAGEMENT

Clinical cure and permanent freedom from the disease are not synonymus (Chaudhuri 1947). Avoidance of reinfection, treatment of cyst passers and prevention of relapses are the main problems.

General—During an acute attack, whether primary or superimposed over chronic, the patient should take to bed, specially if there is fever. In chronic condition the patient should have no restriction of movement. Diet in the acute stage should be liquid consisting of milk, barley-water, yougort and fruit juice. In chronic stage nonresidual food with little roughage is best. Alcohol and fatty food should be avoided.

Symptomatic—Tenderness around the umbilicus and griping pain requires Tr. belladonna 10-15 ms. two to three times a day or atropine sulphate 1/100 gr. hypodermically. Relief is also obtained by keeping the abdomen covered by warm flannel binders. Insomnia if present is cured by administration of phenobarbitone 1½-3 gr. or Dover's powder 5 gr. at bed time.

Specific—At present we have many chemotherapeutic agents and antibiotics which can be used as amœbicidal agents. The alkaloid emetine, halogenated quinolines and organic arsenicals are very common drugs used now-a-days. The drug of choice of acute intestinal amœbiasis is quite different from the drugs for the treatment of cyst passers. Again drugs which are good for amœbic dysentery may not be at all suitable for extra intestinal amœbiasis. One of the drugs most commonly used and most misused is emetine. The impression that cure of amœbic dysentery is obtained simply by emetine injec-

tions repeated periodically is wrong (Chaudhuri 1947). Haphazard administration of emetine cause to develop resistant strains of *E. histolytica* and thus instead of a cure the patient passes into a chronic stage of the disease. Emetine is not curative for intestinal amœbiasis but a drug which surpasses all others in the control of the symptoms.

Acute amœbic dysentery—Specific action of emetine by injection was first demonstrated by Rogers (1952). As the drug controls the symptoms within two to three days, it is the drug of choice in all types of acute attacks. In adults it should be given as deep subcutaneous injection 1 gr. every day for six consecutive days, followed by 1 gr. a day for three days after a restperiod of three days. During the treatment it is preferable that the patient

should be on complete bed rest, but it is not practicable in all cases. There are patients who cannot afford a ten days rest. In such cases the patients should be on complete rest till the symptoms abate a little and then they are allowed to work in the day and receive their injections while retiring to bed. Emetine is not only toxic but a cumulative drug, and therefore not more than 10 gr. should be administered in one course. If it is to be repeated, there should be an interval of at least four weeks. Not being a curative, along with emetine oral administration of drugs having action on both vegetative and cystic forms should be given, oral administration of pentavalent organic arsenicals are useful. Of these carbarsone is more effective and less toxic than acetarsone. Carbarsone should be followed by administration of diiodohydroxyquine. (vide Table 1)

TABLE I
SHOWING DRUGS AND DOSAGE RECOMMENDED FOR USE IN VARIOUS TYPES OF INTESTINAL AMŒBIASIS

Drugs	Acute	Relapses	Chronic
Emetine hydrochloride (INJECTIONS)	1 gr. for 6 days REST — 3 days 1 gr. for 3 days Total 9 gr.	1 gr. a day for four days	
CARBARSONE (ORAL)	(along with emetine) .25 g. twice daily for 10 days	.25 gr. b. d. For 10 days after E.B.I.	after E.B.I. .25 g.b.d. for 15 days
Diiodohydroxyquine (ORAL)	Cabrarsonne followed by .21 g. 6 times a day for 20 days		
Iodochloroxyquinoline	Instead of diiodohydroxyquine — .75 g. a day for 20 days		alternate with carbarsone .75 g. a day for 15 days
Emetinebismuthiodide (Oral)		gr. 1 1st day (at bed time) gr. 2 2nd day gr. 3 subsequently for next 8 days	After penicillin and pathalylsulph. 2-3 gr. a day for 12 days.
Chinofon (enema)		(along with E.B.I.) 2½-4 per cent soln. 8 oz. retention enema. Preferably at night after a cleansing enema with sodibicarb. (2 per cent)	
Penicillin (Injection)			2,000,000 units daily for 7 days.
Pthalylsulphathiazole			along with penicillin 10 g. a day for 7 days.

Recently broad spectrum antibiotics have been tried in the treatment of acute amœbic dysentery. Of all these oxytetracycline has been claimed to have the most effect. Heavy doses of vitamin B complex must be given during treatment with broad spectrum antibiotics.

Relapses—The acute symptoms should be controlled by few injections of emetine (Chaudhuri 1947). It should then be followed by emetine bismuth iodide and carbarsone for 10 days along with chiniofon retention enema. Manson Bhar (1954) recommends combined treatment of chinofon retention enema in the day with emetine bismuth iodide (3 gr.) at bed time for 10 days. Emetine bismuth iodide is less active than arsenicals and oxyquinolines, and the toxicity is same as that of emetine. As it is administered orally, nausea and vomiting are quite common. This is prevented by administration of phenobarbitone 1 gr. $\frac{1}{2}$ hour before E.B.I. Chinofon acts both against vegetative and cystic forms. It is a safe drug and acts both in acute and chronic stages. Oral administration is not recommended.

Chronic amœbic dysentery—Emetine has no action on the cystic stage of the amœba. Moreover amœbicidal drugs do not act effectively in the presence of secondary infection. Both these, that is presence of cysts and secondary infection are the main features of the chronic stage. Administration of emetine is best avoided if vegetative forms are not present in the stools. Best results have been obtained by a combined treatment with penicillin and sulphathiazole, both continued for 7 days, followed by E. B. I. in capsules after meals at bed time for 12 days followed by either carbarsone or iodochloroxyquinoline for 15 days. (vide Table 1)

TABLE 1

Other drugs used in the treatment of chronic intestinal amœbiasis are :

1. Combined bismuth derivative with pentavalent arsenic. This drug is being preferred by some in place of carbarsone, because it is less soluble and less toxic and at the same time quite active in emetine resistant cases.

A gambler and his wife, married ten years, suddenly were visited by a cyclone. It ripped the roof off, picked them into the air, twin beds and all, and set them down a mile from the spot. The husband seeing his wife sobbing, said "Don't cry dear. You are safe." She moaned, "I'm crying because I'm so happy. You see, it's the first time we've been out together in ten years."

2. Diiodohydroxyquinoline. The action is similar to iodochlorhydroxyquinoline group of drugs. It is not very active against vegetative forms, but a drug of choice is symptomless cyst passers.

3. Chloroquine. It is poorly effective in intestinal amœbiasis, but remarkable effect has been reported in the treatment of amœboma (Chakravarty 1954). It is a drug of choice in hepatic amœbiasis.

4. Combinations of chloroquine, iodochlorhydroxyquinoline and arsenicals are being used with good results in the treatment of chronic intestinal amœbiasis.

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The Application of the 'THEORY OF CONDITIONED REFLEXES' to Medicine

And Other Allied Sciences

BY DR. R. K. PAL, D. Sc. (Edin.); M. Sc., M. B. (Cal.) : M. R. C. P. ; F. R. S. E.

Professor of Physiology, R. G. Kar Medical College, Calcutta.

IN July last I have had the pleasure and privilege of visiting the great Pavlov Institute of Leningrad as a delegate to the Atomic Energy Conference held at Moscow. It was a sort of pilgrimage so to say, to the place where the great Russian Scientist lived and worked for more than half a century, irrespective of the fall of the Czarist Empire and establishment of the Supreme Soviet Republic through bloody revolutions. There some forty five to fifty years ago he laid the foundation of the 'Theory of Conditioned Reflex' which has opened up an entirely new field in Physiology with far reaching effects pervading pathology, psychology Medicine, Midwifery and even beyond the range of Medical Sciences, dairy, and animal-husbandary, whereby milk production and egg-laying capacities have been improved in the domestic animals and birds respectively and sometimes noticeable changes in their familial characters for some generations if not permanently.

Although 20 years have passed since the death of this great savant, the work so well begun by him is not only vigorously continued but also has been expanded by his students and colleagues like, Orbeli, Bykov, Baranov, Petrova and many others.

The greatest achievement so far obtained is in its practical application in Midwifery in what is known as 'Painless Child birth'. During the entire period of constant and vigilant ante-natal care a condition is created in the higher nervous system of the expectant mother with a belief that pregnancy and child birth are nothing but physiological processes like eating and drinking ending with defecation and micturition respectively and if normally developed should not involve any suffering, which helps them to overcome the age-old fear of it. A mental training of this kind if properly given makes the would-be mother calm during her confinement, with a conscious approach to it. Of course occasionally X-ray skiagrams are taken to determine the exact position of the unborn infant and any abnormality noticed is corrected immediately and very rarely a pain relieving injection is given only to one or other hypersensitive patient. Thus during delivery pains are much alleviated or completely eliminated.

The causes of functional disturbances of the higher Nervous System such as neurosis, hysteria, schiziphenia etc. have been thoroughly investigated by Pavlov and his co-workers by this method and based upon the definite observations they strove to build up an experimental therapy of these disorders consistent with the pathogenesis, so that the functional pathological state of the cerebral cortex was brought closer to the field of pharmacology of the higher nervous activity.

Immediately before his death, on the basis of his close observations for half a century, Pavlov classified animal and human higher nervous activity into well defined types drawing a parallel between these types and classification of temperament by the ancient Greek Scientist Hippocrates. They are the following: (1) Strong but unequilibrated or *Impetuous* type (where the excitatory process prevails over the inhibitory ones), analogous to the 'Choleric' temperament of Hippocrates, (2) Strong and equilibrated that is *Quiet or Slothful* type with 'phlegmatic' temperament, (3) Strong, quite equilibrated but at the same time *labile* with 'Sanguine' temperament and lastly (4) the *Weak* type with susceptibility to inhibition, having a 'Melancholic' temperament. Nevertheless all the types are equally liable to a constant and pronounced susceptibility to inhibition. Human beings, he further divides into two distinct groups, (a) Artists and (b) Thinkers, the first including writers, painters, musicians and others, perceiving reality as a whole, without breaking or decomposing it while the second, such as the scientists, philosophers, judges and the like, on the contrary, dismember first and then assemble to revive it, which in many instances, unfortunately they cannot accomplish. In the former group there is the predominance of the primitive or the first signalling System, comprising of different recepto mechanisms in response to different stimuli, conducted to the corresponding cells of the C.N.S. while in the latter 'Signalling System' of the Second order comprising of the signals of the initial signals in the shape of speech-spoken, auditory and visual is the dominating factor. A general disequilibrium of the nervous system with derangement of dynamic correlation between the two systems affecting the sub-cortical and cortical activities respectively in the first

group causes *Hysteria* whereas in the second, *Psychasthenia*.

Catalepsy, according to Pavlov is a hypnotic state—a partial sleep of the higher parts of the nervous system, respect of depth and localisation spreading only to definite levels and parts of the brain stem and hysterical analgesia, anaesthesia, paresis and paralysis are only inhibiting symptoms as manifestations of partial local sleep. *Schizophrenia* too, is nothing but an expression of chronic hypnotic state—in the catatonic form of which the symptoms can be regarded as physiological protective inhibition, limiting or fully excluding the activity of the brain damaged by some unknown noxious agents. Such catatonic form shows a higher rate of recovery by proper treatment with physiological rest when the patient is kept away from the action of constant and strong stimuli emanating from the surroundings and prolonged narcotic sleep, always maintaining the level of sound and deep natural sleep, never bringing it to the state of Narcosis, with or without Insulin-Shock. In such cases stimulating methods and remedies are definitely injurious.

Alcoholic delirium shows predominance of the first signalling system and develop on a back ground of intermediate state between wakefulness and sleep,

whereas *alcoholic hallucination* is based on the dominating second signalling system, which as a rule, disappears by the action of usual therapeutic doses of adrenaline and atropine.

After his demise so full of years, honour and glory, his students headed by Petrova, following the same line of experiments have come to the conclusion that functionally weakened cortex of the brain, either inborn or acquired by experimental measures of severe nervous collisions or break-down or functional neurosis, is responsible for chronic processes of skin dystrophy in the shape of exudative or scaly eczemas, loss of hair, furunculosis and even malignant papillomas, showing thereby that the weak type of Pavlov is more prone to these conditions.

The great seer and Savant concluded one of his last speeches with the remark; "On the whole this new field of 'Physiological Research' is indeed, highly fascinating and satisfies two concomitant cravings of the human mind—the striving to acquire newer and newer truths and the protest against any claim to finality in the knowledge already gained," has only proved too prophetic today.

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A NOTE ON THE USE OF "THIOMERIN"

By K. N. RAMAN, M.B., B.S.

"Anaimalai Clinic" Anaimalai, South India.

"THIOMERIN Sodium" is a recent and valuable addition to the list of organic mercurial compounds used as diuretics.

Mercury has been extensively used in Ayurvedha since ancient times, and Indian physicians have recognised, along with its other properties, its diuretic action also. Metallic mercury (Blue Pill) and calomel increase the output of urine, if a small amount is absorbed from the gut, and have been used for centuries in the treatment of dropsy.

Mercurial diuretics became really popular after the introduction of organic compounds (like Novasurol) which produce an impressive output of urine. "Mersalyl" (the official B.P. preparation) "Neptal" and "Salyrgan" are organic compounds containing 36 to 40 per cent of mercury. They are used for injection as a 10 per cent Solution, with 5 per cent of theophylline added to increase the rate of absorption and excretion, and to diminish local pain at the site of intramuscular injection.

Thiomerin is an organic compound containing slightly less than 30 per cent of mercury. It contains mercaptan in place of theophylline of the other drugs mentioned above. It is a white amorphous powder available in sterile vials containing 1.4 grams and 4.2 grams of the compound. This is dissolved in 10 cc. or 30 cc. of sterile distilled water respectively, before use. The solution so prepared is clear, and is stable at temperatures below 80° F. for 40 days or more, and this may be stored and used for repeated injections. The mercury content of the solution is 4 per cent—similar to the official injection of Mersalyl.

Pharmacology:—Thiomerin, like the older mercurial diuretics acts on the cells of the renal tubules, blocking the re-absorption of water and Electrolytes (mainly chlorides and Sodium) from the urine filtering down from the glomeruli.

The result is an increase in the volume of urine and in the amount of sodium chloride excreted. The plasma volume is lowered and is rapidly made good by absorption of fluid from oedematous tissues.

The chief advantage of thiomerin over the older mercurial diuretics is that it is well tolerated locally, and

may be injected subcutaneously. It may also be given intramuscularly or intravenously. Given subcutaneously, the diuretic action equals that of the older drugs, and toxicity is low, so that this drug is really a significant advance in therapy. The rates of absorption and excretion are slightly slower, and the diuretic action extends over a period of 24 to 36 hours. Excretion of the drug is practically complete in 48 hours. Provided renal function is not impaired, it is thus possible to continue the injections indefinitely, and in practice, the occurrence of renal complications as a result of repeated injections is extremely rare, if patients are carefully selected for treatment.

Indications:—Thiomerin is used in the treatment and prevention of oedema of cardiac origin. It is of value in oedema of hepatic, and (in carefully selected cases) of renal origin. It is of no value in oedema of lymphatic or venous obstruction.

1. For the relief of distressing oedema of congestive failure of the heart, Thiomerin is the remedy par excellence, acting irrespective of whether the lesion is rheumatic, hypertensive or myocardial. A more valuable application is the use of the drug as a prophylactic to prevent oedema in heart failure, and to circumvent the occurrence of "cardiac asthma" and pulmonary oedema. A patient with congestive failure may gradually accumulate as much as 8 to 10 pints of excess fluid in the body tissues before clinical evidence of pitting oedema appears. Such a condition may be termed "latent oedema" and is recognised clinically by

- (i) increase of body weight.
- (ii) signs of pulmonary congestion
- (iii) tender engorged liver
- (iv) dyspnoea on moderate exertion
- (v) cough on lying down at night.

An injection of thiomerin confirms the diagnosis by producing an impressive output of urine and a dramatic relief of symptoms. By repeating the injections at suitable intervals, the patient may be kept free from symptoms.

2. *Cirrhosis of liver:*—Treatment may be started with a course of injections of Thiomerin to relieve the

oedema and ascites, and the patient put on the modern therapy for cirrhosis—high protein and low Sodium diet.

3. *Nephrosis* :—Only cases with a Non-Protein-Nitrogen of less than 80 mgms. per cent are suitable. The dose of Thiomerin used is small — 0.25 to 0.5 cc. Used thus, Thiomerin helps to relieve the distressing massive oedema.

4. *Cortisone therapy* :—Oedema due to retention of salt occurring under cortisone treatment is amenable to Thiomerin.

Method of use :—1. Urine examination : A moderate amount of albumin is commonly found in congestive heart failure. It is not contra-indication and clears up under Thiomerin treatment. A centrifuged deposit of urine is examined carefully, and any evidence of renal disease so discovered is a contra-indication for mercurial diuretics.

2. Ammonium chloride may be given orally, 30 grains on the evening before injection and 30 grains three times on the day of injection. The diuretic response is thereby increased; also an excessive loss of chloride and development of alkalosis are prevented. The drug, however, tends to produce nausea and vomiting which are undesirable in cardiac patients, and for routine use, it may be omitted.

3. *Preparation of the solution* :—The solution for injection is prepared by adding 10 cc. of water to 1.4 grams of the powder with usual aseptic precautions. The result is a crystal clear liquid. When used for repeated injections, the solution is carefully examined each time; the development of turbidity or colour is an indication for discarding the vial.

4. *Small initial dose* :—The diuretic response of the individual patient is unpredictable. Some persons excrete such a large amount of urine rapidly after injection that they suffer from symptoms of dehydration and loss of electrolytes—drowsiness, headache and muscle cramps. When commencing treatment, it is preferable not to exceed a dose of 0.5 cc. for the first injection.

5. Intramuscular injections into the gluteal region, using the correct technique, are safe, and produce the desired diuresis. Thiomerin may be safely given subcutaneously also, if care is taken to avoid injecting into the skin or too superficially. The outer aspect of the arm may be used. Oedematous and adipose tissues are avoided. In emaciated individuals and the obese,

intragluteal injection is preferable. When repeating the injection it is wise to carefully choose a new site each time.

6. *Avoid intravenous injections* :—Toxic reactions are more frequent with intravenous injection—urticaria, convulsions, vomiting, irregular action of heart. Sudden collapse occurring within a minute or two of completing the injection is now known to be due to hypersensitivity of the cardiovascular system to mercury, and the intravenous route is best avoided.

Sudden deaths have occurred after intravenous injections of mersalyl even in patients who had previously been receiving the drug regularly by the same route. There is usually no warning sign of the impending catastrophe. Since it is the mercury which is incriminated, the potential risk is present even with Thiomerin.

7. *Measure output of urine* :—The daily output of urine is estimated by collecting and measuring all urine passed in 24 hours. A similar estimate for 24 to 36 hours after the injection gives us an idea of the diuretic response.

8. *Restriction of salt intake* :—Normal amounts of salt taken during meals will lead to retention of sodium and water, and an early recurrence of oedema. Very low sodium diets are not practicable or desirable in general practice. Some restriction is therefore aimed at by asking the patient to avoid salted dishes and permitting liberal amounts of such items as fruit, milk, buttermilk, ice-cream, sweets and rice. No restriction of fluids is necessary.

9. *Frequency of injection* :—The patient's weight is noted, and it is the object of therapy to try and maintain him in his normal "dry weight". The amount of urine passed after each injection is measured; if this diminishes, and the patient's weight does not increase during the intervals between injections, these intervals may gradually be increased. So the data on which the spacing of injections depends are (i) Weight of patient, (ii) output of urine, (iii) appearance or subsidence of oedema.

If the response to an injection is poor, one is tempted to give a second bigger dose; but the risk of accumulation of mercury in the system has to be borne in mind. (See causes of poor response below)

It is advisable to examine the urine of patients on Thiomerin once a week. Toxicity is shown by appearance of albumin and R.B.Cs.

10. *Digitalis* :—If patients have been on digitalis for sometime, rapid reabsorption and excretion of oedema fluid may produce sufficient concentration of the drug in circulation to cause toxic symptoms. The importance of using a small initial dose in such patients is obvious.

CAUSES OF UNSATISFACTORY DIURESIS

Some of the causes of poor results are considered here.

1. Low chloride values of blood as in severe salt restriction combined with previous diuretic therapy. Ammonium chloride may be administered to correct the deficiency.

2. Hypoproteinæmia is a common cause in our country, due to malnutrition or cirrhosis of liver. A good diuretic response can be expected only when the nutritional deficiency has been corrected.

3. A low cardiac output of the terminal stages of heart failure may be the cause, as very little glomerular filtrate is being produced by the kidney.

4. Morphia and barbiturates, commonly given to cardiac patients, inhibit the action of mercurial diuretics.

5. Sometimes a combination of aminophylline intravenously, ammonium chloride orally, and Thiomerin intramuscularly will prove effective when the last (given alone) fails.

SUMMARY

Thiomerin is used to produce rapid relief from oedema, especially in congestive heart failure. It is valuable in preventing the development of cardiac asthma and pulmonary oedema.

The drug is safe and effective, and may be repeated indefinitely by intramuscular injection.

The guides to treatment are (i) Weight of patient (ii) urine output (iii) Oedema.

Toxic symptoms are extremely rare. They are watched for by routine examinations of urine.

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WHY DON'T PEOPLE USE CONTRACEPTIVES

By DR. B. KRISHNA RAO, M. B., B. S.,
(Post Graduate in Sexology of the Karlov University, Prague)

Specially contributed to "Surgical & Medical News", Bombay.

THE question of birth control has received much attention in this country in the last few years. Much has been said on the need for controlling the rise in population. There has been enthusiastic support from all quarters and in the first Five-Year-Plan 65 lakhs of rupees were set apart for the establishment of birth control clinics and for research work. Over Rs. 10 crores are expected to be provided in the Second Five-Year-Plan for the training of personnel, opening of family planning clinics, establishment of a research institute, etc.

In spite of all the enthusiasm all round and the keen desire of people to family limitation the movement has

not spread as widely as one would expect. Surveys carried out in different areas show an overwhelming desire to family limitation and the wish to learn a method. Yet we find that only a few of those who express a desire do actually present themselves at the clinics and even those that have learnt a method often give up or slacken resulting in unwanted pregnancies. For example, in a recent survey in Bombay, in which 100 women were interviewed, 93 were in favour of birth control. Of these, 63 were in favour of using contraceptive methods but only 8 of these actually used the methods! In every clinic it is the experience that a fair number "drop off". The question may be asked: Why every year thousands of women become pregnant

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without desiring it? Why do not these women who are in a continued state of anxiety for their menstruation, use the good contraceptives which are available?

The use of contraceptives is not a question of mere technical knowledge. Nor is planned parenthood just an ideal birth rate seen only from a statistical point of view.

In a survey carried out by Hoffmeyer in Denmark of a group of 500 women, 64% had not used any method. Of these 30% said they "were thoughtless" or "were just going to procure" or "had already procured but have not yet started using"; 12% were totally ignorant of any anticonception; 21% did not believe any effective method existed and were also afraid of possible injuries such as cancer and "inflammation"; 8% felt ashamed to discuss with the doctor their personal lives or refused on æsthetic, ethical or religious grounds; 6% were influenced by the reluctance of the male partner. He points out that in deciding what type of contraceptive should be adopted by a person or group a number of psychological, anatomical, biological and social factors involved should be considered. Our greatest interest should be to use a method that would be acceptable to a majority of the population even if there effectiveness is not high.

The propaganda of thousands of years against sexual enjoyment has left its mark on the great mass of people. People are ashamed of the pleasure they experience in the sexual act. Sexual intercourse without the procreational aim is tabooed. A mixture of feelings of guilt and shame on the one hand and partly defiance of these inhibitions on the other result in rationalisations which often assume curious patterns of behaviour; the pessary is not available handy; the pessary is ready at hand but the woman does not want to disturb herself by making an interruption; after all nothing may happen this time, etc. Unconscious maternal drives often get the better of conscious wishes to avoid parenthood.

Sexual intercourse is the culmination of an emotional upsurge and to have to be interrupted by a visit to the toilet to do her contraceptive drill interferes with the sexual preparedness of the partners. The spontaneity of the sexual intercourse is seriously impaired. In the

hypersexual male such a disturbance often causes detumescence and renewed attempts are unsuccessful and lead to unhappiness. In men with premature ejaculation to put on a condom may result in failure of the erection or even ejaculation may occur in the process.

Many women do not find the standard methods of contraception æsthetically acceptable. They find them messy and disagreeable.

It would appear that the most acceptable contraceptive would be one which besides being reliable will not involve direct application on the genitals and will not interfere with the crescendo of mounting passion. They should be such as could be taken sometime early in the menstrual cycle so that it will prevent ovulation or fertilisation or nidation. Oral contraceptives seem to hold out a great promise. In the meantime, we shall do well to investigate carefully into the sexual habits and coital difficulties of the couple before advising any method of contraception—the method should suit the users. Attempts to make them suit the method are bound to result in failures and disappointment to all concerned.

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COMPLETE PROLAPSE RECTUM

By DR. S. P. SRIVASTAVA, M.S., F.R.C.S. (Eng.)

Professor of Surgery, Medical College, AGRA.

ANY prolapse of rectum more than 2" in length is a complete prolapse. It is a sort of hernia of the rectovesical pouch with the walls of the rectum protruding outside the annal orifice. The length of anterior wall is more than the posterior and the opening of the rectum points posteriorly. Rarely the anterior and posterior walls may be equal in size. The external sphinctre is patulous due to the persistent prolapse.

Complete Prolapse of rectum may be reducible or irreducible and is said to occur more commonly in ladies. In my series all the cases were males between the ages of 20 and 40 years.

I have treated five cases of irreducible prolapse of rectum by recto-sigmoidectomy as it is the treatment of choice when conservative treatment is unsuccessful and the prolapse does not reduce. One of these cases returned again with a recurrence and was later treated with Pemberton's modification of colopexy. All of these cases were between 35 and 40 years. They used to get prolapse for several years. When these became irreducible then conservative treatment was resorted to first which was successful in one case only. Operation was performed upto 10 or 15 days after the occurrence of Prolapse. There were no signs of obstruction to faeces or flatus. Usually the help of plasma or blood was taken and arrangements for it should always be ready as the bleeding may be very severe at the time of resection of the bowel.

REDUCIBLE COMPLETE PROLAPSE

Recto-sigmoidectomy is a more shock producing operation than Roscoe Graham's for reducible prolapse. This operation was originally devised by Mickulicz and then first described by Miles in 1933 and is being done by Mr. Gabriel at St. Mark's Hospital. It has the greatest draw back of an inefficient repair of pelvic floor which leads to recurrence in 60% of cases. One of the chief causes of this is that the sac of the sliding hernia of the anterior rectal wall as described by Moschowitz in 1912 is left undisturbed and untreated in Recto-sigmoidectomy. Also the external sphinctre remains dilated and partly atonic. Thus the only correct treatment of complete rectal prolapse should be to remove a part of the peritoneal pouch of the floor of Douglas or its obliteration with repair of pelvic diaphragm. This can be achieved only by an abdominal

operation either by obliterating the sac by a number of circular purse string like sutures in the pelvic basin or by doing the Roscoe Graham's operation. The redundant portion of peritonium of the pelvic floor is excised and the sutured pelvic floor is at a higher level than before. The dissection of the peritonium from the front wall of rectum is difficult and likely to injure the muscular wall.

The repair of the pelvic floor is done by Mr. Graham by suturing the anterior borders of the Levatorani together which are difficult to identify. These sutures constrict the lumen of rectum and perhaps they give way or get loose. I have found it very difficult to put these sutures successfully and I prefer to put three interrupted chronic catgut sutures on either side of the rectum uniting its lateral wall to the deep fascia covering the upper surface of Levatorani muscles. These sutures prevent the prolapsing of the walls of rectum outside due to firm adhesions developing there.

Thorough repair of the pelvic diaphragm i.e. Levatorani muscles is very difficult from above working inside the pelvis.

Perhaps the introduction of fascial strips across the true pelvic brim by Mayo and reformation of peritoneal floor at that level on it may be a better procedure of repair but of this I have no experience. Probably a successful perineorrhaphy can be done from below through the Rectovaginal or Rectoperineal approach as advocated by Mc. Cann or by suturing the anterior borders of Levatorani together as an additional step after Rectosigmoidectomy as advocated by Cohn, Gabriel and Dunphy. With this technique Gabriel reports only 25% recurrence.

The method of perineal repair by Llyod Davis by the introduction of floss silk slings between the rectum and vaginal is worth consideration and trial. The side walls of the rectum are sutured to the sacrospinous ligaments from below upwards. The front wall of rectum is also sutured to vaginal wall and thus a Rectovaginal septum is reconstructed.

The great disadvantage of a Recto-sigmoidectomy is the loss of rectal sensation which initiates the act of defæcation and perhaps the stretching of the pelvic floor by increased intraluminal pressure brings about evacuation after this operation.

To avoid damage to the external sphinctre mechanism the circular incision of the annal canal should be made 1" below the ano-rectal line as advocated by Mr. R. R. Thompson. Even then he stresses the point that by removal of the rectum proper the receptor organ for initiating the motor activity of sphinctre is lost and so slight disturbance of sphinctre mechanism persists giving rise to incontinence.

There might be some disturbances also of the motor and sensory nerves supplying the sphinctre which is already dilated and toneless. Thus the repair of external sphinctre by introduction of wire or fascia should be supplemented after any operation of complete prolapse whether Recto-sigmoidectomy or Roscoe Graham.

I have treated four cases of complete prolapse of rectum by Roscoe Graham's operation with very good results so far, and two cases by Pemberton's and Stalker's modification of colopexy. The four cases of Graham's operation were aged between 25 and 30 years, young men of lean and thin type. They had the prolapse since childhood which went on increasing gradually. The peritoneum of the recto-vesical pouch was dissected away as much as possible and removed. The surface of levatorani as exposed on either side of the rectum and the latter was stitched to the pelvic fascia covering it by at least by three stitches of chronic catgut on either side. Mr. R. Graham advises the suturing of the medial borders of levatorani together with the overlying fascia in front of the rectum but these stitches were difficult to put and narrow the lumen of the rectum. I prefer to discard these anterior stitches.

In my opinion the cure of the prolapse, on the principle of a sliding hernia is brought about mainly by removal of the peritoneal flap of the recto-vesical pouch, and the repair of defect in the pelvic floor (pelvic fascia and levatorani) is not very perfect. Only the stitches between the sides of the rectal wall and pelvic fascia can be applied easily and are effective. In the two cases where Pemperton's and Stalker's modification of colopexy was done, the pelvic cavity was very narrow and dissection and clearing of the pelvic floor was very difficult. Here the sacral hollow was cleared of the fat and the peritoneum on either sides of the rectum was stitched together behind it. The rectum was elevated and the region of recto-sigmoid was stitched to the left side of the pelvic brim, as is done in colopexy. One of these cases was a recurrence from previous recto-sigmoidectomy done for irreducible prolapse four years ago in a patient aged 40 years. The first case done was 25 years old and the second 40 years. In both these cases the flap of peritoneum in the recto-visical pouch was dissected and removed before fixing

the elevated rectum to the left pelvic brim. The first case is doing well but the second again had recurrence of a mild degree which was treated by submucous injections of 5% carbolic acid in almond oil with good results for about six months, and then again had recurrence. A steel wire was then introduced in the external sphinctre which tightened slightly to allow the passage of finger easily. This relieved the patient for a year when the wire broke and had to be removed. He did not get any recurrence later on. Another weak patient of complete prolapse had also to be treated by the Thiersh's operation, of introduction of a wire in the external sphinctre.

All cases of complete prolapse in children were treated by sub-mucus injections of 5% carbolic acid in almond oil with very good results. They rarely need operative interference. Their general health has to be built up.

In my opinion Lokhart Mummery's operation fails to cure complete prolapse of rectum and has led to recurrence in all my cases.

The disadvantage of Lockhart Mummery's operation is that it does not fix the anterior wall of rectum and for this Mc. Cann's operation of stitching the anterior portions of levatorani has to be done. The latter aims at the retentive mechanism which prevents the bowel from prolapsing during defæcation. This operation which was originally described for prolapse in females is being practised for males.

For weak and anæmic subjects who cannot bear the shock of a big operation, Thiersh's operation is very good to tighten the external sphinctre and prevent the prolapse from occurring.

A CASE OF TRAUMATIC APPENDICITIS

By R. H. KAZMIERSKI, B.S. M.D. F.I.A.P.

Coudersport, Pa. U. S. A.

(Exclusive to "Surgical & Medical News")

TRAUMA as a cause of appendicitis is more common than generally supposed, and is overlooked simply because in the examination of a case of vermiform appendix, the questioning or elicited history is not directed toward it. Industrial surgeons and accident insurance companies, however, know that traumatic appendicitis is not a myth, but a perfectly definite disease, and in some cases the courts of our country have ruled that they are just as liable as they are for any other accident. As Urban Maes⁽¹⁾ remarks, the incidence of traumatic appendicitis is not as important as the fact that the disease is a clinical entity.

Traumatic appendicitis may be defined as an inflammatory state of vermiform appendix resulting from extraneous mechanical injury. This definition thus excludes three other causative agents which might be construed as traumatic. (1) bacterial trauma, following the usual infective invasion of the appendix. (2) trauma produced by intraluminal foreign bodies themselves; for example, minute abrasions of the appendiceal mucosa, caused by crystallized vegetable iron or vegetable hairs, (Shatock)⁽²⁾ or trauma caused by pins, seeds, worms, etc. (3) trauma to the appendix when it is involved in an unrelated pathological process, as when the appendix becomes strangulated in an inguinal hernia. This report is concerned with appendicitis which follows severe forces applied to the abdominal wall.

The exact mechanism of traumatic appendicitis has never been satisfactorily established. Ludington⁽³⁾ remarks that the deep location and the mobility of the appendix, which is the reason it is habitually quoted as protected from trauma, is not as effective as seen, for the reason that the abdomen is not a solid mass in which the force could act only in the direction in which it is applied, but a liquid or gaseous mass in which force exerted against is transmitted in all directions. The most reasonable theory advanced to explain traumatic appendicitis has to do with over-distention of the organ by the influx of the fecal contents of the cecum as a result of the trauma, experimentally found in the works of Furginger and Van Hansemann⁽⁴⁾. These workers using colored fluid for demonstration were able to force contents of a fecal cecum into an obstructed appendix by light manual pressure, with resulting rupture of the mucosa and extra-

vasation and infection. Radiologists tell us following the use of barium enema and barium meals that often with very little pressure barium can be forced from the cecum and from the ascending colon into the appendix. A case reported by N. A. Ludington⁽³⁾ of a school girl 19 years of age with a previous history of appendicitis, complaining before leaving the physician's office that the examination made the whole right lower quadrant ache. As a result of the palpation in the physician's office, sixteen hours later her symptoms were increased and a laparotomy disclosed a ruptured appendix.

The striking thing about the cases reported in literature is the frequent presence of fecalith in the appendix, or reported lying free in the peritoneal cavity. Kelly⁽⁵⁾ reported thirty fecaliths out of fifty cases.

Local changes which may occur in the production of traumatic appendicitis are of five types; (1) force applied to external wall may cause a rush of fecal contents into the lumen of the appendix and produce actual rupture, but this is probably rare. (2) mucous muscular tears may be produced resulting in areas of fecal stasis and invasion of the appendiceal wall. Narrowing of the lumen from any cause, particularly by pressure of fecaliths, enhances this possibility. Aschoff⁽⁶⁾ stated that since lymph follicles of the appendix are pushed forward as far as the mucosa it follows that if any injury occurs, the mucosa could be ruptured down to the capsule of the node. After careful search he frequently was able to demonstrate the very fissures filled with fecal bacteria, which extended from the lumen to the substance of the lymph node. The presence of fissures does not necessarily prove that trauma occurred, but their presence does indicate that the lumen has been over-distended to the point of rupture of the mucosa, allowing organisms to enter into the substance of the wall. Pus is sometimes found dissecting the mucosa from the muscularis. (3) Violence may cause injection of the fecalith in the lumen producing intraluminal stasis. Since the appendix cannot empty, a "closed loop" type of obstruction occurs. Likewise a highly infected nidus is produced, which cannot drain. (4) A haemorrhagic infarct may be produced with a subsequent perforation. (5) The force—impacts a fecalith against the appendiceal wall causing a point of pressure necrosis. Rare causes

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of actual evidence of trauma to the appendix, however, have been reported. Lupton⁽⁷⁾ recorded an instance in which the abdominal musculature was said to have been bruised and hematoma of the ilio-cecal cecocolic appendiceal junction found.

Traumatic appendicitis is most prevalent in persons with thin anterior abdominal walls, defective or poorly developed abdominal musculature. As far as musculature is concerned, the contributing causes of any intra-abdominal traumatic lesions are that the muscle be in a state of relaxation and application of force be sudden and unexpected by the recipient. Kicks, blows, athletic injuries, vehicular accidents, strain in lifting heavy objects, falls against protruding objects, industrial accidents, etc., variously have been accused as direct etiological factors.

Some interesting histories of trauma causing appendicitis are found in literature. Bartels⁽⁸⁾ case of a 27 year old farmer kicked by a calf—developing typical symptoms of acute appendicitis, including right side rigidity and tenderness. Burgess⁽⁹⁾ 46 year old Hawaiian male using a pneumatic drill to raise a tunnel through stone, rested the butt of the drill in the right iliac area. The cases of Rhodes and Birnbaum⁽¹⁰⁾ — 37 year old sergeant being struck in the lumbar region by a gun rack—a 21 year old laborer struck in the lower abdomen. A 20 year old police officer "kneaded" in the right lower abdomen during a scuffle; 11 year old boy struck in the abdomen by a volley ball; a 24 year old truck driver struck on the right flank by a piece of machinery; a 13 year old female struck in the abdomen by a base ball; a 9 year old female falling on the side walk and striking the right lower quadrant on the curb. Crohn's⁽¹¹⁾ case of an 8 year old boy struck in the abdomen by a base ball bat, three hours later complaining of abdominal pain and tenderness, severe vomiting, rigidity and rebound tenderness. Pease's⁽¹²⁾ case of a 50 year old male who while lifting a stove in the shipping department of a large stove factory, slipped, falling flat on his abdomen on a concrete curb. Two months later while spading a garden developed an acute gangrenous appendicitis.

In the reported cases the clinical picture is first pain at the site of injury and peritoneal shock. The significant symptom is that there is a quiescence of pain for a period of time, after which symptoms and signs characteristic of appendicitis renew with violence.

Treatment of traumatic appendicitis is of course, surgery, and needs no discussion.

My own case was a 35 year old thin male, Mr. A. K., admitted to the Port Allegany Community Hospital on 8/24/53 with a history of intermittent pain in the right lower quadrant of one year's duration. Pain had been worse in the last three weeks accompanied by nausea and vomiting. The significant point in the history was the onset of pain while changing a tire; he slipped and fell backwards on the ground striking the right side of his lower abdomen with a tire wrench. This pain in the right lower abdomen persisted for 24 hours requiring bed rest.

Physical examination was essentially negative except for some chronic hypertrophied tonsils, and pain and tenderness on pressure over the right lower quadrant. At the time of operation through a right rectus incision, a large mass of thick adhesions was present from the distal cecum to the anterior lower abdominal wall, in which the appendix was incorporated. The adhesions were separated by blunt and sharp dissection with an appendectomy. Patient was discharged from the hospital on 9-1-53 with an uneventful recovery. He was seen several months later free from former symptoms.

CONCLUSION

Traumatic appendicitis is a definite clinical disease entity. It is commoner in occurrence than is generally supposed. Individuals with thin or poorly developed abdominal walls are most susceptible. Specific history of external violence is always noted. It is of importance especially to industrial surgeons because of the medical-legal aspect.

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A youthful reporter had been sternly reproved by his editor for his periphrasis, verbosity and circumlocution (known as the Thesaurus syndrome). "Cut your stuff down, son," advised the editor. "Get to the meat of your story. No extra words."

The following day the boy turned in this account of the last day of a prominent citizen. "Mr. Howard Gillespie, well-known attorney, was crossing Centre Street today when he clasped his hands over his heart and muttered, 'I'm going to die'. Then he leaned against Mrs. Brown's fence and made good".

A Review of 400 Cases of Typhoid Fever Treated with and without Chloromycetin

BY K. SHADAKSHARAPPA, B. Sc., M. B., B. S., M. S. (Medicine) Illi — Chicago.
Medical Officer, Government Hospital, Davangere.

D. KRISHNA MURTHY, M. B., B. S., Late I. M. S.,
Malnad Nursing Home, Shimoga.

B. R. SHAMA RAO, M. B., B. S., Late I. M. S.,
Malnad Nursing Home, Shimoga.

THIS article is based on a series of 400 cases of typhoid fever encountered by us during 1951-1954 in hospital and general practice. The clinical material is in the main from Shimoga town with a population of 45,000 and in part from Davangere town with a population of 55,000 both towns belonging to Mysore State. Both the towns had protected water supply, though lacking in underground drainage. The disease is considered endemic in these parts. No systematic epidemiological survey of study of this disease.

In 15 families more than one member of the family was the victim of this fever. Six patients gave a history of previous T. A. B. inoculation of whom, one ran through a severe course of the disease.

The primary object of this paper is to study the merits of chloromycetin in the treatment of typhoid fever, as also to determine the optimum dosage of this drug to the poor patients. Incidentally mention is made of some facts relating to etiology age and sex incidence, clinical features, relapses, complications, mortality etc. of typhoid fever (vide table I, II, III, IV & V).

Laboratory investigations: In 330 cases the widal test was positive for typhoid (dilution 1 in 100 and above). 15% showed delayed positive reaction. In the remaining cases the blood could not be sent for widal reaction, the diagnosis being based on clinical grounds alone. Blood, urine and stool cultures could not be done in any case for want of facilities.

Chloromycetin was administered in 140 cases. This number includes patients in the hospital and those treated at home. The drug could not be used liberally in all cases on account of its prohibitive cost, the main indication of its use being severe infection. The dosage schedule of 18-21 grammes was followed in seven cases who could afford the drug. In the remaining cases the dosage had to be modified on account of the poverty of the patients. The dosage adopted in the

latter group was an initial dose of 2 capsules (0.25 gm. each) followed by 2 capsules 4 hours later and subsequently one capsule every 4th hour during the first day, one capsule every 4 hours during the second day one capsule 6th hourly during 3rd day and one capsule 8th hourly during the next 6 days. The patients aged 9 years and above were given the adult dose. In a few cases of extreme poverty the total quantity of chloromycetin used was just 6 grammes. When a patient exhibited a relapse of the disease, to fight out the relapse he was given a total dose of 6 gms. of chloromycetin spread over suitably.

The following points were observed during treatment.

(1) There was conspicuous general improvement in about 72 hours following the administration of chloromycetin. The temperature touched normal within 48-72 hours. The patients convalesced very rapidly.

(2) In six patients there was sudden fall of temperature to a subnormal level resembling peripheral vascular collapse, and all of them recovered with supportive therapy. So in patients who are acutely ill it is advisable to use a smaller initial loading dose. If the temperature falls to subnormal level and with this there is marked lowering of blood pressure it is prudent to stop the drug for 24 to 48 hours.

(3) In one case marked jaundice was observed, the day after the administration of the drug. The patient died 36 hours after the onset of jaundice. The death might have been due to the sudden liberation of a large amount of endotoxin acting deleteriously on liver cells. No post mortem examination could be done on this case.

(4) There was no visible immediate effect on the mental condition of the patients by chloromycetin though the temperature was brought under control. Restlessness with perforation and one with hæmorrhage succumbed. When such intestinal lesions are seen

it is very essential to insist on the patients remaining in bed for a sufficiently safe period.

(5) The case fatality rate was low in chloromycetin treated cases considering the severity of the infection in which was exhibited.

The relapse rate seems to be significant in the series which have received chloromycetin. Out of 7 patients who had 18-21 gms, 3 cases relapsed. The relapse rate does not always depend on the amount of the drug administered. The cases that relapsed appeared in good condition and were able to withstand the disease better than those in non-chloromycetin group. A few of the relapsed cases ran a mild course and responded to the usual conservative treatment. Usually the relapse cases responded well to a second course of chloromycetin. Five cases that relapsed for a second time responded well for a third course of chloromycetin. Where the drug was used in the first week of the disease there was no relapse at all.

(6) Nausea was noticed in 2 cases but in vomiting. Retention of urine was observed in the second day following the use of chloromycetin and was promptly relieved by catheterisation. (Retention of urine was also seen in 2 cases of non-chloromycetin group.) 3 patients who had relapse for the second time developed macrocytin anæmia to prolonged intermittent chloromycetin therapy though all of them made an uneventful recovery. Since fatal apalstic anæmia has been reported in children following chloromycetin administration a careful watch has to be kept for the appearance of this complication.

48 hours after taking chloromycetin two patients who were in the relapse phase showed marked psychic disturbances such as hallucination, agitation restlessness and they became very violent. The drug had to be withdrawn in these 2 cases and thereafter they made satisfactory progress.

(7) 4 patients had Intestinal hæmorrhage and three had perforation of the Intestines during the afebrile stage while still on chloromycetin. Relapses in typhoid fevers treated with chloromycetin might be due to the lowering of the agglutinine. With this in view 8 patients were given ¼ cc, ½ cc, and ¾ cc of T.A.B. vaccine on the 5th, 7th 8th and 9th day respectively of the fever while the patients were on chloromycetin. There were no relapses in these cases. It is likely that early ambulation in chloromycetin treated cases might have played some part in determining relapses. It is difficult to predict

which cases relapse and which do not, when treated with chloromycetin. This appears to be a serious disadvantage of chloromycetin treatment apart from the prohibitive cost of the drug. It is advisable to use the drug when there is severe infection. Presence of convulsions, delirium, photophobia, twitching of the muscles, lowering of blood pressure, persistant rapid pulse tympanitis indicates severe infection and marked toxæmia.

DISCUSSION

It is now agreed that of all the antibiotics tested todate chloramphenicol is the drug of hoice in the treatment of typhoid fever. Terrymycin and aureomycin are of some benefit in typhoid fevers but large number of typhoid patients do not respond to the above two agents. Chloramphenicol while it shortens the period pyrexia and intoxication, it does not eliminate complications like intestinal hæmorrhage or perforation. Physicians who have had experiences of the typhoid fever, previously and have known their helplessness to shorten the prolonged course can now appreciate the usefulness of chloramphenicol. It is said given in conjunction with cortisone chloramphenicol aids even more rapid recovery. When relapse occurs there is usually a satisfactory response to a second course of the drug. In one study the relapse rate was reduced when chloramphenicol was given in interrupted courses and was supplemented by antityphoid vaccine. This requires further follow up. In few cases chloramphenicol does not completely eliminate Solmomella typhosa from the body and they may persist or reappear in the stools and in urine after treatment, and relapse may occur in as many as a third of the patients treated. Chloramphenicol will not clear up the chronic carrier state in persons previously untreated. Chloramphenicol has been of greater value in the clinical management of typhoid fever than in the epidemiological control of the disease.

SUMMARY

- 1. 400 cases of typhoid fever have been reviewed.
- 2. Some interesting clinical features observed during the course or the disease have been described.
- 3. The dosage of chloromycetin employed in our series was 2 capsules (each capsule of 0.25 gms.) to start with followed by two capsules four hours later, than one capsule 4th hourly for the first two days, one capsule 6th hourly for the next day and one capsule eight hourly for the next 6 days, or a total of 9 gms. spread over 9 days.

- 4. The relapse rate seems to be significant in the chloromycetin treated cases. The relapse rate does not always depend upon the amount of the drug administered. We feel that the drug should be used during the first week of the disease.
- 5. Cases of relapse responded well to a second course of chloromycetin.
- 6. It is advisable to use this costly drug in typhoid fever when there are indications of severe infection. No troublesome reactions to the drug were encountered in our series except in two patients who developed severe psychotic symptoms necessitating the withdrawl of the drug. It is advisable to start with a small initial does in patients who are actually ill manifesting signs of circulatory failure.

- 7. Chloromycetin has a definite place in the treatment of typhoid fever. It is not a life saving drug in the last stages of the disease.

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TABLE I

AGE—SEX DISTRIBUTION OF ENTRIC CASES

<i>Age groups in years.</i>	<i>Male.</i>	<i>Female.</i>	<i>Total.</i>
0 — 10	106	54	160
11 — 20	101	48	149
21 — 30	37	12	49
31 — 40	14	8	22
Over 40	15	5	20
Total	273	127	400
Maximum between 0 and 10 years			
Below 20 years	309		
Above 20 years	91		
Total	400		
Except between 21 and 30 where the ratio is 3 : 1			
Sex ratio	Male	:	Females
	2	:	1

TABLE II

CASE FATALITY RATE (C.F.R.) IN THE CHLOROMYCETIN TREATED AND THE REST

Nature of treatment.	No. of cases treated.	No. of deaths.	C.F.R. per 100.
Chloromycetin groups	150	5	3.3
Non-Chloromycetin groups	250	20	8.0

Difference in rates 4.7
One case died 24 hours after and the other 36 hours after the administration of chloromycetin.

TABLE III

CASES FATALITY RATE ACCORDING TO AGE GROUPS AND LINE OF TREATMENT

Age groups.	Chloromycetin.			Non-chloromycetin.		
	Cases treated.	Deaths.	C.F.R. per 100.	Cases treated.	Deaths.	C.F.R. per 100.
Below 20 years	98	2	2.0	210	15	7.1
Above 20 years	52	3	6.0	40	5	12.5
Total	150	5	3.3	250	20	8.0

TABLE IV

RELAPSE RATE

Line of treatment.	No. of cases treated.	No. of relapse.	Relapse rate per 100.
Chloromycetin group	150	38	26
Non-Chloromycetin	250	22	8.8

Chloromycetin group : 5 cases relapsed for the 2nd time.
Chloromycetin was not used in 6 relapsed cases.
Non-Chloromycetin : 5 cases relapsed cases responded well to chloromycetin.

TABLE V

PERCENTAGE INCIDENCE ON COMPLICATIONS

Nature of complications.	Number of cases treated			Percentage incidence.	No. of case ending fatality.
	In chloromycetin group.	In the rest.	Total.		
(1) Hæmorrhage	4—(1)	4—(3)	8	2	4
(2) Perforation	3—(2)	5—(5)	8	2	7
(3) Parotitis	Nil	6	6	1.5	—
(4) Cystitis	Nil	3	3	0.75	—
(5) Exposure Keratitis	Nil	3	3	0.75	—
(6) Acute conjunctivitis	Nil	1	1	0.25	—
(7) Hemiplegia	Nil	1—(1)	1	0.25	1

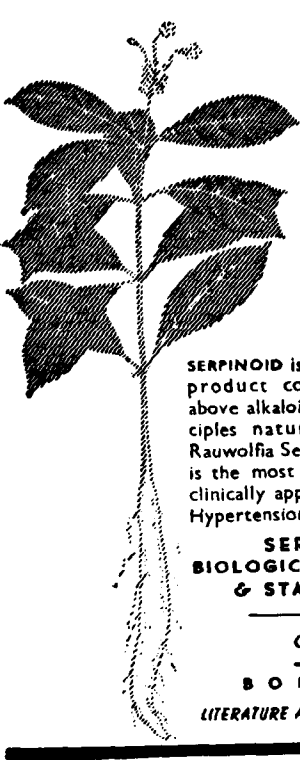
TABLE V

PERCENTAGE INCIDENCE OF COMPLICATIONS

Nature of complications.	Number of cases treated			Percentage incidence.	No. of case ending fatality.
	In chloromycetin group.	In the rest.	Total.		
(8) Aphasia	4	2	6	1.5	—
(9) Severe toximia with circulatory failure	12—(2)	18—(11)	30	7.7	13
(10) Hæmatemesis	1	Nil	1	0.25	—
(11) Hiccough	1	Nil	1	0.25	—
(12) Retention of Urine	4	1	5	1.28	—
(13) Tympanitis	4	2	6	1.50	—
(14) Pneumonia	Nil	2	2	0.50	—
(15) Epistaxis	Nil	3	3	0.75	—
(16) Perpharal niritis	2	4	6	1.50	—

INDICATES CASES ENDING FATALITY

Nature of treatment.	Total cases.	Cases with complications.	Percentage incidence.
Specific therapy	150	35	23
Non-specific therapy	250	55	22



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GENITAL FISTULÆ

BY DR. VISHNU SARMA, M.A. (Cantab.) M.B.B.Chir., M.R.C.S. (Eng.) L.R.C.P. (Lond.)

Fellow, Royal Society of Medicine, London.

Civil Assistant Surgeon, Government Women & Children's Hospital, Egmore, MADRAS.

".....but there is one accident liable to occur in the female — and that too, in the exercise of the highest function of her nature—which dooms her to isolation and seclusion, renders her presence intolerable to friends and compels her to exist in an atmosphere, repugnant in the highest to her own sense."

— D. Hayes Agnew. 1867.

GENITAL fistulæ comprise one of the most distressing among female complaints.

It has been known since ancient times. In Mahfouz's beautifully illustrated three-volume book there is a plate showing an Egyptian "mummy" with a vesico-vaginal fistula. The person is believed to be a negress girl who danced at the court of Mentuhotep (2050 B.C.). The shape of her pelvis leads one to suspect that contracted pelvis was the cause of her fistula.

The famous Arab physician Avicenna was probably the first to describe the condition and associate it as a complication of difficult labour.

DEFINITION

An abnormal communication between two cavities is termed a fistula. In genital fistula any part of the bowel or urinary tract may communicate with the genital tract. Various names are given depending on the structure involved and the level in the genital tract at which the fistula is located.

An opening between the bladder and the vagina is called "Vesico-vaginal fistula." A fistula which connects the urethra and the vagina is termed "urethro-vaginal fistula". When a part of the ureter communicates with the vagina it is spoken of as a "uretero-vaginal fistula". A "vesico-uterine" fistula permits the bladder and uterus to communicate. (Fig. 1)

Of the different types of fistulæ which may arise between the urinary and genital tract, only the vesico-vaginal fistula is common.



Fig. 1. A diagram to show the commoner types of genital fistulæ.

1. Vesico-vaginal fistula
2. Urethro-vaginal fistula
3. Recto-vaginal fistula.

A recto-vaginal fistula is a communication between the rectum and the vagina. (Fig. 2)

ÆTIOLOGY

Congenital

Congenital fistulæ are the result of maldevelopment. They are rare but the condition in which an additional ureter of one kidney opens into the vagina causing

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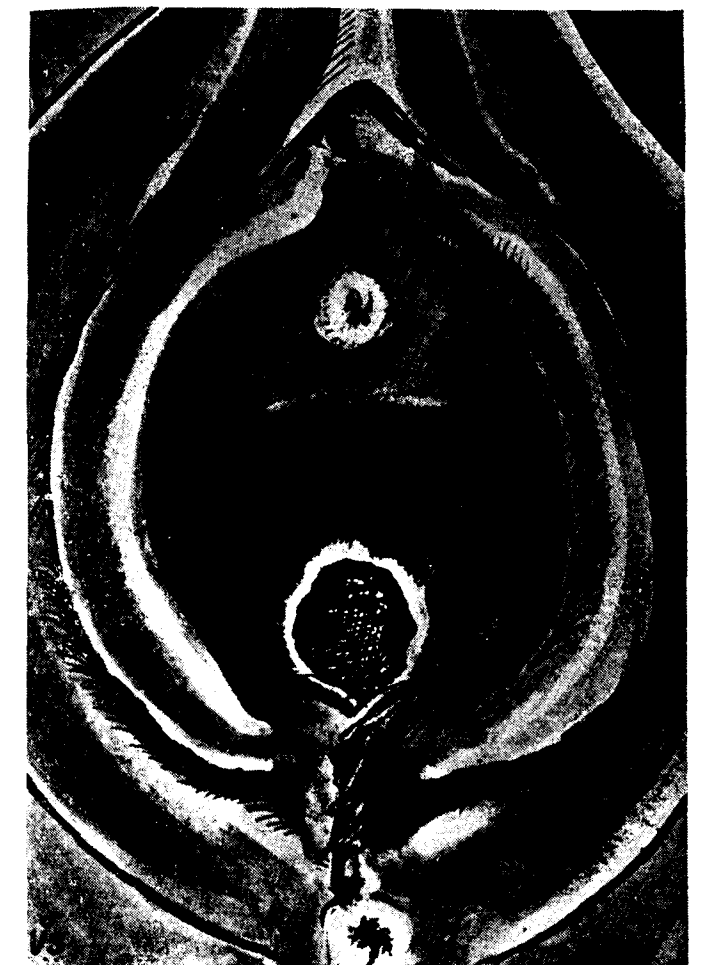


Fig. 2. Incomplete healing of a complete perineal tear has resulted in this recto-vaginal fistula.

urinary incontinence is of considerable interest (Fig. 3 & 4.).

TRAUMATIC

Direct injuries such as a fall on a sharp pointed instrument may lead to a fistula. The unskilled person who attempts criminal abortion is sometimes responsible. Young victims of rape and newly-wed virgins who submit to the violence of brutal husbands are also prone to this malady.

Child-birth trauma plays the most important part in the ætiology of genital fistulæ. Cephalo-pelvic disproportion is the commonest cause of prolonged and difficult labour. When cases such as these do not receive skilled obstetric supervision, the foetal head gets



Fig. 3. The external genitalia of a child to show an ectopic urethral orifice just below and to the left of a normal urethral opening.

held up either at the entrance to or within the cavity of the bony pelvic birth canal. The bladder neck becomes compressed against the pubic symphysis. Prolonged pressure on the bladder neck devitalizes it. The tissues necrose and slough away and the unfortunate patient is left with a fistula (Fig. 5.)

Faulty obstetric judgement is sometimes to blame.

When forceps are applied to secure delivery, when all the conditions which make its application safe are not present, the violent traction which is inevitably necessary inflicts considerable damage. The bladder which may not have been completely emptied, (worse still no



Fig. 4. Urinary incontinence in a female due to an ectopic ureter is a rare but interesting condition. The accessory ureter on the left side is seen opening into the vagina just below the true urethral orifice.

attempt might have been made to empty it) gets torn on rare occasions. If the tear is complete urine begins to dribble through the vagina. On the other hand if the bladder wall is severely bruised, urinary incontinence begins only when the slough separates. Skilled obstetric care plays an important role in the prevention of genital fistulae.

Destructive obstetric weapons such as cephalotribes and cranioclasts are not generally encountered in modern

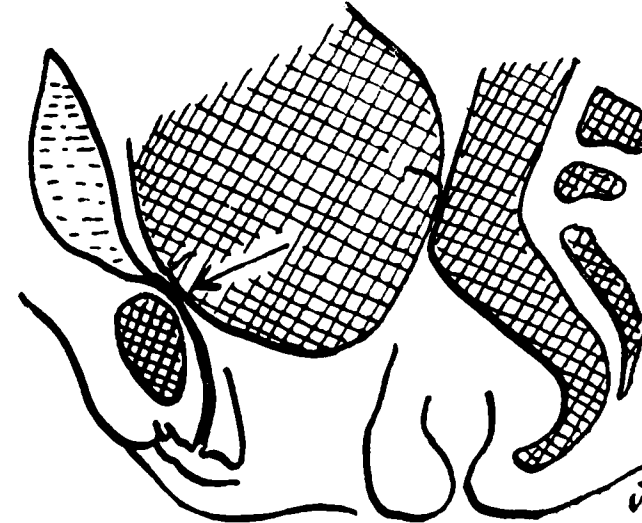


Fig. 5. This diagram shows how a disproportionately large foetal head may press on the vesico-urethral junction. Sustained pressure will cause ischaemic necrosis and then fistula formation.

obstetric practice. Yet from time to time a craniotomy is necessary to deliver the dead child. The sharp point of the perforator may slip and injure the bladder. At other times a spicule of bone projecting from the foetal skull may cause a vesical rent.

In modern units as the number of cases of genital fistula from neglected labour dwindles, the frequency with which abdominal and vaginal operations are performed, increases the incidence of fistula complicating surgical procedures.

Abdominal total hysterectomy, Wertheim's operation for cervical cancer, vaginal hysterectomies and repair, are all operations in which the ureter or bladder and other structures are prone to injury.

Radium is used both for inducing a menopause and in the treatment of genital tract malignancy. Overdosage results in damage to tissues and genital fistula is a well known complication.

INFECTIONS AND NEW GROWTHS

Pelvic abscesses occasionally discharge themselves both into the vagina and rectum. Para-rectal abscesses may do likewise.

Rarely a vesical calculus ulcerates its way into the vagina. Foreign bodies in the vagina and rectum have on rare occasions been known to cause fistulae. Various diseases of the genital tract may lead to genital fistulae.

Advanced malignant ulceration leads to fistula formation oftener than diseases such as chancroid, syphilis, and tuberculosis.

In Egypt, bilharziasis although a common cause of fistula formation in males only rarely gives rise to vesico-vaginal fistulae.

Incomplete healing of a complete perineal tear is the most common cause for a Recto-vaginal fistula.

CLINICAL FEATURES

Symptoms

A vesico-vaginal fistula allows urine to enter directly into the vagina. The lack of sphincter control allows urine to flow continuously. The patient is always wet. Decomposing urine produces an unpleasant ammoniacal stench.

Irritant urine pouring constantly and dampening the vagina, vulva, perineum and the crural skin gives rise to cutaneous excoriation. Encrustations form on the vulva and the pudendal hairs become undermined by abscesses. The urine sooner or later become infected.

Unbearable pruritus and the unpleasant odour makes the poor patient a social outcaste.

One cannot improve on the vivid picture painted by Johann Friedrich Dieffenbach of Konigsberg of the miserable lives which patients afflicted with severe vesico-vaginal fistula lead. He wrote "There is not a more pitiable condition than that of a woman suffering from vesico-vaginal fistula. The urine constantly flowing into the vagina and partially retained there, and heated, runs down the labia, perineum, and over the nates and thighs, producing a most intolerable stench. The skin of these parts becomes inflamed and covered by a pusulous eruption. An insupportable itching and burning sensation tortures the patient, so much so, that she scratches the skin to bleeding. Many tear the incrustated hair out of the pudendal parts, calling on death to relieve them from their suffering. The comfort of a clean bed, that grave for all sorrows and afflictions, is not their lot, for it will soon be drenched with urine. The air of the room of the unfortunate woman nauseates the visitor and drives him off. The husband has an aversion for his own wife; a tender mother is exiled from the circle of her own children. She sits, solitary and alone in the cold, on a perforated chair. This is not fiction, but naked truth and the cure for such an evil is the prize for which we labour."

It is therefore not strange that patients so afflicted readily consent to any operation which might hold out some hope of cure.

SIGNS

There is constant dribbling of urine and in severe cases the patient leaves a wet trail behind her as she walks to the examination couch.

GENERAL APPEARANCE

Her face is drawn with misery. Chronic afflictions often give rise to malaise and anaemia. Urinary infection may contribute in a large measure to this, as well as to attacks of pyrexia and rigors and perhaps even impairment of renal efficiency.

Pelvic examination is best carried out with the patient in the lithotomy position. The skin of the vulva and perineum is sodden and excoriated and may be the seat of many small abscesses (Fig. 6). There may be scratch

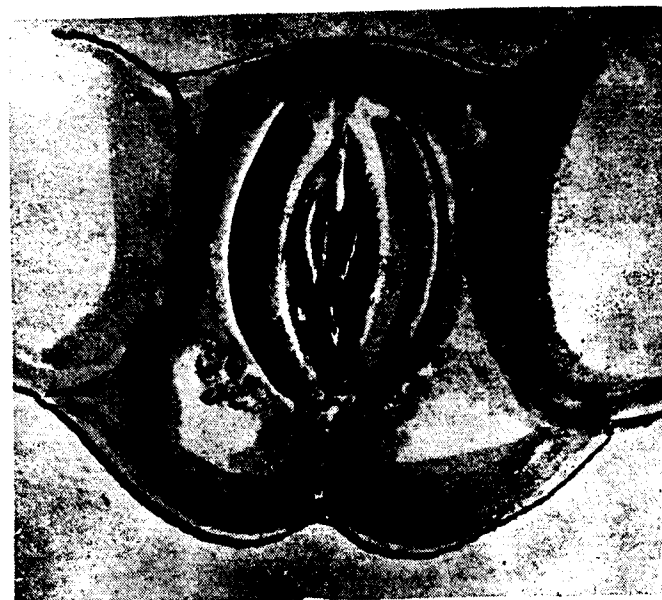


Fig. 6. The appearance of the external genitalia and the thighs in a severe case of vesico-vaginal fistula of long duration. Irritant urine causes a vaginitis and severe excoriation of the vulva and perineal skin.

marks to show that the patient has pruritus. If the fistula is a large one urine may be seen seeping out through the vaginal orifice. Before an internal examination is done the patient should be asked to empty her

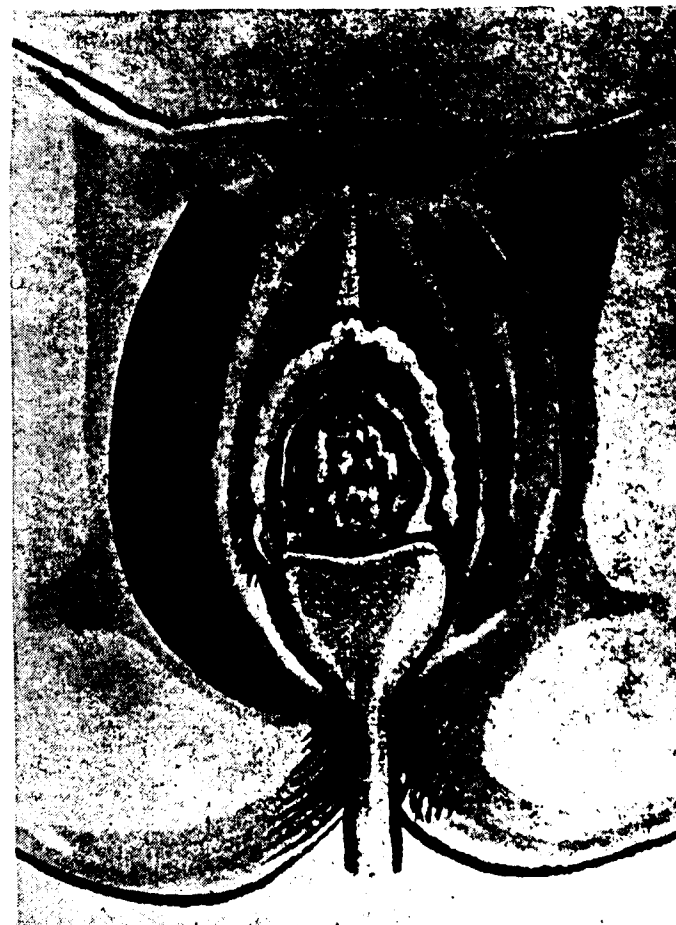


Fig. 7. Sometimes the bladder mucosa may protrude as a reddish velvety mass through the orifice of a large vesico-vaginal fistula.

bladder although usually the bladder is not capable of holding urine because of the fistula.

Small fistulae are difficult to feel but moderate sized ones may be felt. Around the orifice of the fistula there may be considerable induration and perhaps even incrustation due to deposits of phosphates. Fistulae high up in the vault may not be obvious at first. Occasionally the bladder mucosa prolapses through the fistula and presents as a reddish velvety mass. (Fig. 7)

After a thorough and systematic routine pelvic examination the vagina should be examined with the aid of a speculum. This helps to visualize the fistula. If the lithotomy position does not give adequate exposure and indeed fistulae high up in the vaginal vault are not easy to identify, the patient should lie in Sim's position or the knee-chest attitude which makes the vagina balloon out. With the aid of a Sim's speculum the fistula becomes easily visualized. (Fig. 8).



Fig. 8. An examination with the patient put in the knee-chest position enables a vesico-vaginal fistula to be seen with ease. The inset shows a Sim's speculum.

If the fistula is a small one the escape of urine may not be apparent. Under such circumstances it may be necessary to put in coloured fluid such as Methylene blue into the bladder to reveal the fistula.

The bladder is emptied using a catheter which is left in place. The vagina is cleansed and three medium sized cotton wool swabs are put inside. A quantity of sterile water coloured with Methylene blue is poured into the bladder through a funnel connected with the catheter. After some time the swabs are taken out and examined. If the lowest swab is blue and the others are dry, the patient has urethral incontinence. If the middle or upper swabs are stained blue but the lower one is dry the patient has a vesico-vaginal fistula. If the upper swab is wet but not blue the patient has a uretero-vaginal fistula.

When a fistula is examined it is desirable to find out its exact nature, location and size. The presence of scarring and induration surrounding the fistula should be noted (Fig. 9).



Fig. 9. This pre-operative photograph shows a vesico-vaginal fistula in a young patient, 19 years of age. She gave a history of prolonged labour for which forceps were applied and a still born child delivered. She began dribbling urine on the 4th day of the puerperium.

Photographs such as these form a valuable documentary record when the success of treatment is reviewed.

SPECIAL PROCEDURES

When the fistula is small cystoscopy may be of advantage. The difficulty of course is to distend the bladder with fluid when inspecting it through the cystoscope. To overcome this difficulty temporarily plugging of the fistula with a finger or by pinching the labia together so that the bladder and vagina hold the fluid may be tried. In some units attempts have been made to use a thin transparent condom over the end of a cystoscope and distend it with fluid and look through this. The main purpose of all those procedures is to identify the ureteric orifices and note its relation to the fistula.

Cystoscopy helps also to exclude the presence of an additional unsuspected fistula and exclude the presence of calculi. A good idea may be obtained of the condition of the bladder mucosa.

Intra-venous pyelograms are undoubtedly of great value as they reveal not only the state of the renal tract but also reflect the efficiency of renal function. Such

information is of great help in deciding on the nature and extent of the operation to be undertaken.

DIFFERENTIAL DIAGNOSIS

Congenital fistulae are rare and they should be excluded as a cause for urinary incontinence. The stress incontinence which not uncommonly follows a moderately difficult labour should also be excluded. This is due to lax sphincter tone and the stress incontinence lasts only for a short time in the puerperium. It responds to conservative management.

TREATMENT

The well established fistula does not heal spontaneously but the recent ones may do so provided the bladder is suitably drained. If spontaneous closure does not take place within 6 weeks of the injury it is unlikely that it ever will and operative repair is essential.

Even a very concise account of the surgical treatment of genital fistulae becomes incomplete if we do not pay a tribute to the early pioneers notably James Marion Sims. (Figure 10). To find a cure for this distressing complaint had worried many a surgeon but it was Sims who discovered a satisfactory method of exposure and suitable material for the repair of fistulas. He tried his operations again and again on his brave negro women patients, who despite their suffering and painful operations, gave Sims their full and unreserved support. At last he operated in 1849 on a young coloured woman in Alabama for the 13th time and was successful. Marion Sims wrote his famous paper "On the Treatment of Vesico-Vaginal Fistula" as he lay ill with a chronic form of dysentery. He decided he must publish the details of his method so that other surgeons might carry on with the work from the point where he had left it.

When his health improved Sims went to New York and was successful in founding "The Women's Hospital". It was the first hospital in the modern sense of the word to be devoted exclusively to the treatment of women's diseases. His able assistant, a young doctor named Thomas Addis Emmet did a great deal to perfect Sim's operative treatment of Vesico-vaginal fistula.

OPERATIVE TREATMENT

A vesico-vaginal fistula may be approached by the vaginal, transvesical (supra-pubic) or the transperitoneal route. The choice is governed by the nature of the fistula and the surgeon's preference.

The vaginal operations are of two main types:



Dr. James Marion Sims
1813-1883

GYNECOLOGY GIANT

Fig. 10. Dr. James Marion Sims, often called the "Father of Gynecology in America," was a pioneer surgeon. He discovered an original procedure and won world renown with his successful surgical treatment of vesico-vaginal fistula, generally considered incurable up to that time.

Dr. Sims perfected and popularized a simple technique, chief feature of which was the use of silver wire sutures. The consistent success of his new procedure was attributed to the silver sutures and use of the Sims' position, Sims' speculum, special needles and inlying catheter he himself devised. The invention of these instruments greatly contributed to the advance of surgery.

(Courtesy J.A.M.A.)

1. The modern form of Sim's classical operation. Even with the primitive and unsatisfactory anaesthesia of those

times, Marion Sims cured 230 patients of their vesico-vaginal fistula out of 312 who sought his aid. These are astonishingly good results.

The modern operation incorporates the principles outlined by Sims, the application of which alone makes for success. They are:

1. The use of special methods of exposure,
2. The free denudation of the vaginal edges of the fistula,
3. The use of silver wire in place of thread sutures that had hitherto been generally employed (Nylon is used by modern gynaecologists), and
4. Adequate drainage of the bladder after closure.

2. The flap splitting operation. This plastic operation is necessary in selected cases. There are several modifications of this operation. In moderately sized or a large fistula, sometimes a hinge graft may be used for its closure. The graft is obtained by the partial section of the vaginal wall or by splitting one or other labium minus. These operations are very complicated and are necessary only in special cases.

CONCLUSION

Genital fistulae is a very distressing malady. If offers a problem of considerable magnitude to the gynaecologist. As obstetric trauma plays an important part in its aetiology, skilled obstetric management can do a great deal to lessen its incidence.

The treatment of vesico-vaginal fistula calls for resourceful, patient and meticulous surgery guided by the principles outlined by the great Marion Sims. If one may quote Prof. Chassar Moir's words "Nothing can equal the gratitude of the women who, wearied from constant pain, depressed by an evergrowing sense of the humiliating nature of her infirmity, and desperate from the realisation that she is an offence to others, suddenly finds herself restored to full health and able to assume her rightful place in the family."

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Melba was born in Lourenco Marquis. She had her education in Lisbon where she obtained her M.D. in Gynaecology, and also D. G., D. T. D. She later did her post-graduate studies in Paris. She was Medical Officer of the Cancer Institute of Lisbon when she married Dr. R. G. Kamat, who was the Chemical Engineer of the Portuguese Government. She worked in England and Belgium and later set up practice in Angola, in Portuguese West Africa. For Melba's and her husband's anti-portuguese views the Government of Portugal confiscated their properties and they recently arrived in India.

* * * * *

DR. C. G. KING—THE AMERICAN NUTRITION EXPERT

Dr. Charles G. King, the noted American Nutrition Expert was here in India recently on a six-week-visit as Special Consultant to the UNICEF to advise the authorities and agencies here engaged on nutrition and allied problems. Talking about his mission to India Dr. King said that he was here to assist administrative officers in developing their plans so that the U.N. Organisation could make its assistance as effective as possible in the further developments to improve feeding and health conditions for mothers and children in this country.

Dr. King agreed that there was wide-spread malnutrition particularly among mothers and children in India and this he thought was due to dietary deficiency both quantitatively and qualitatively. The customary Indian food is very deficient in protein which is vital to the growth and development of resistance to infection among infants, one of the predominant factor of infant mortality.

Protein deficiency was also responsible for the increase in the incidence of T. B. besides retardation of growth, less resistance, infection and damage to the glands of the body, apathy and deleterious effects on the nervous system. In addition there was also wide-spread deficiency of Vitamins and particularly Vitamin A, which led to increased incidence of anæmia among children and mothers.

Dr. King said that as India's food pattern largely eschewed meat, fish and poultry which were the best



Dr. Charles Glen King, Executive Director,
The Nutrition Foundation Inc.

sources of protein, the next best was to increase in the consumption of milk and more milk and particularly toned milk would be an excellent source of protein. The problem however remained to make it available to the people at a low cost and to produce more milk.

Professor of Chemistry at the Columbia University Dr. King was the co-discoverer of Vitamin C in 1932. To his credit stands a vast volume of research on Biochemistry and Nutrition in the United States. In 1942 he was asked to take over the Directorship of the Nutrition Foundation, Washington and later he became a Member of the National Academy of Sciences, Washington which is the highest institution of the kind. He was also for some time President of the Society of

Biologists and Chemists and the American Institute of Nutrition. He was closely associated as Consultant with various Government agencies in Public Health and agricultural services. In 1955 he served as Chairman to organise and conduct the International Conference of Nutrition Scientists at Princeton to deal with world-wide problem of Nutrition deficiency and continued research on patterns of action that will take things in the right direction. Dr. King has read about 250 Papers on his subject before several American and International Gatherings.

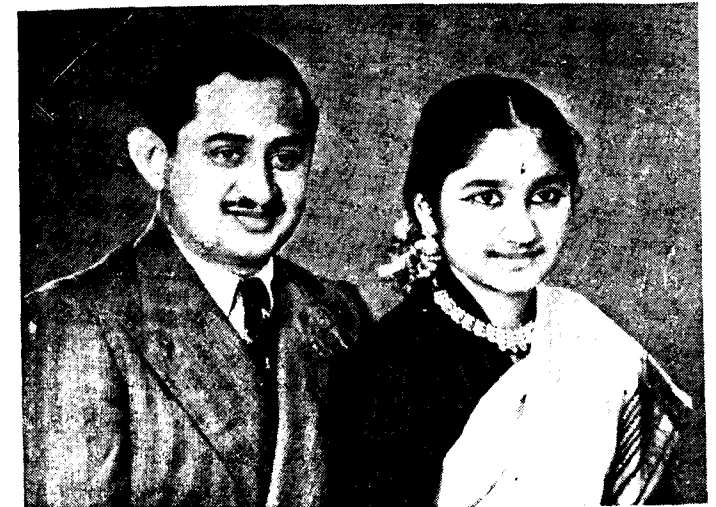
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DR. VISHNU SARMA

We rejoice to learn of the wedding of one of the members of our Editorial Board, Dr. Vishnu Sarma to Kumari Sugantha Kunthala at Coimbatore, South India, on 27th April. We offer the young couple our warmest good wishes.

Dr. Sarma took the Natural Science Tripos at Emmanuel College, Cambridge and then was at St. Bartholomew's Hospital, London, for his clinical studies.

(Continued on page 54)



Dr. Vishnu Sarma — Sugantha

At this oldest hospital in London, he won the Matthews Duncan Prize in Obstetric Medicine: the first Indian to win this coveted prize. Student of the late Wilfred Shaw, he has chosen Obstetrics and Gynaecology as a speciality.

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heart beats are picked up and recorded. From the intensity and regularity of these impulses much can be learned about the heart's condition. There is one major drawback to the standard electrocardiograph. It can be used only when the patient is at rest, usually lying down. Thus all that it can record is the condition of the heart when no strain is placed upon it. It is impossible to obtain a comparative reading of the heart's actions during various degrees and kinds of bodily exercise.

With the new broadcasting device, heart beat changes under almost any conditions of exertion can be determined. It consists of the electrodes and amplifier of the conventional electrocardiograph, a radio transmitter and batteries, all of which are worn by the patient. In addition, there is a radio receiver, amplifier, speaker and recorder, which are located in the doctor's laboratory.

The precision of this receiver is such that it picks up faint signals of a certain wavelength clearly in spite of any disturbing elements in the laboratory, such as electrical equipment, fluorescent lights and surrounding walls. The messages received from the patient's heart can be heard through a high fidelity speaker, or can be written down on paper by a moving pen recorder.

With patients suffering from various heart conditions, the new device will probably be of considerable help in determining how much activity a patient may undertake without danger of heart strain. The degree of exertion often is critical. The heart may be able to force blood through hardened arteries with comparative ease when the patient is at rest. But as soon as he exercises, his oxygen intake increases and the heart has to pump harder.

** ** *

THE MANIKIN THAT
'BREATHES' AND 'BLEEDS'

The first member of a highly important new military contingent goes on active duty this month: a six-foot, 145-pound artificial man so true to life it breathes, has a pulse beat, even 'bleeds'. Eighteen months in the making, this synthetic patient, plus 19 others now in production will be used by the armed forces of U. S. A. as a uniquely effective teaching aid for personnel of the medical services.

The plastic manikin is amazingly realistic. Pulse beat and blood flow have been achieved by hooking a pair of pumps to a small, stainless-steel internal tank

containing a solution which resembles blood in colour and consistency. The liquid is pumped to various parts of the body through a network of surgical tubing.

By means of a control panel outside the model, an instructor can regulate the pumps to simulate various injuries and allied reactions. The pulse rate, for example, can be varied from 50 to 130 beats a minute. 'Blood' may be made to drip or gush from wounds in the limbs, chest, abdomen or head, vividly duplicating either venous or arterial bleeding. Emergency surgical procedures can be practiced on the model, the handling of fractures demonstrated and blood transfusion made. The use of pressure points and proper bandaging will stop bleeding on the manikin just as surely as they do on a living person.

The model patient first was conceived at the Naval Medical Centre in Bethesda, Maryland, U. S. A. in 1950 by Dr. J. Victor Niiranen of the Dental corps. William Young, a civilian artist who directs Navy medical exhibits, developed a functional multipiece body.

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Sculptor Louis di Valentin fashioned molds for the individual body parts. Bob Geoghegan and Tom Haynes of the Rogay Models Co. which has won a contract to assemble the finished dummies, helped Niiranen and Young to develop the intricate mechanical innards. A prototype finally was completed in 1953. A year later it was decided to produce a perfected model under the supervision of the Navy's Bureau of Medicine and Surgery for distribution to all the military services.

Admiral Bartholomew Hogan, the Navy's Surgeon General, has stated proudly of the final version: 'This manikin represents a major accomplishment in the field of medical training'.

Civilian doctors are equally impressed. Professor Othmar Solnitzky, of Georgetown University's School of Medicine, was able to capitalise on his school's Washington location to borrow the manikin recently for an anatomy class. "The model is so beautifully done and so dramatic". Dr. Solnitzky reported, "that even though the students knew it was artificial, some fainted when it started to bleed".

** ** * ** *

NEW X-RAY EQUIPMENT INSTALLED AT
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A determined effort is being made in Britain to reduce the toll of suffering and industrial absenteeism taken by the many forms of rheumatism. The Charterhouse Rheumatism Clinic in London, one of the world's leading diagnostic centres for the disease, has just installed new X-ray equipment designed specially for this work. The new equipment consists of a four-valve, oil-immersed X-ray generator with a maximum output of 100,000 volts at a current of 500 milliamps. It also includes specially constructed a very low X-ray examination couch and an upright wall stand for taking X-ray films in erect position. Both are mechanically linked and electrically synchronised with the control table. X-ray examination of any part of the body can be carried out with the minimum of discomfort to the patient.



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HUMAN SKIN "GARDEN" TO AID BURN VICTIMS

A "garden" in which living human skin will be grown has been started at Duke University in the United States. It is hoped that it will provide the means of saving thousands of lives now lost each year as a result of burns.

A small piece of the burned person's own skin will be set to growing. In two weeks the piece of skin may be multiplied to 10 times its original size, laboratory experiment have shown. This will give a good-sized piece for grafting. For a permanent graft to replace skin burned off, victims must have some of their own skin. Skin grafted from a relative or donor lasts only 10 to 30 days. The Duke University project is believed to be the world's first skin garden and the first recorded attempt to reproduce the patient's whole skin consisting of both outer layer and true skin grafting.

** ** **

U. K. DEVELOPS ANTI-POLIO VACCINE— MANUFACTURE BY TWO BRITISH FIRMS

During May and June this year, between a quarter and a half-million children in Britain will be given a degree of protection against the scourge of paralytic poliomyelitis by a new vaccine. This has been developed by two leading British Manufacturers, working in co-operation with the Medical Research Council. The vaccine, a modification of that used in the U. S. A. is safe as any vaccine can be said Mr. R. H. Turton, Minister of Health, at a press conference in London recently.

It will not be available in quantity till the end of the year but limited amounts should be available during May and June—the months most suitable for its use—and selected groups of children between the ages of two and nine will be vaccinated before the start of the polio season. The Government is buying from the manufacturers all the vaccine that can be produced during the next twelve months.

Mr. Turton said that in 1955 there were 7,305 notified cases of Polio and 240 deaths. He expressed the hope that Britain was now on the verge of a triumph comparable to that achieved against diphtheria after 1934. The vaccine will be offered free to local health authorities in the United Kingdom, in batches sufficient to vaccinate 50,000 or more with the necessary two injections.

Vaccination will be suspended after June 30—the period when polio is most prevalent—as it is considered unsafe to vaccinate during this period. Selection of

children to be vaccinated, from amongst those whose parents seek it, will be made according to a centrally determined plan designed to maintain a uniform spread through the eligible age groups.

The vaccine is being manufactured by GLAXO LABORATORIES LTD., who were the first to produce a polio vaccine in Britain—and BURROUGHS WELLCOME LTD.

A GLAXO Spokesman said that, in conjunction with Burroughs Wellcome, it was hoped to have, by the spring, sufficient supplies of the new vaccine to immunize half-a-million children. The modified vaccine is a result of six month's research by Dr. W. Wood and his team at a Glaxo Company's virus research laboratory.

The spokesman explained that the difference between the original Salk Vaccine and the new one is that a less virulent strain is used than the Mahoney strain. In addition, more safety testing devices have been introduced. All supplies of the new vaccine will go to the Ministry of Health for distribution.

** ** **

MAMMOTH HOSPITAL FOR HONG KONG PLANNED

Plans for a new major hospital—the biggest of its kind in the Commonwealth—have been approved by the Hong Kong Government. The mammoth hospital will have 1,275 beds and will cost approximately £. 3,125,000. It is scheduled to be completed by 1960.

To be known as the New Kowloon General Hospital, the building will be of 13 storeys. Besides provision for a special children's section of 200 beds, the hospital will have a complete range of the most modern facilities available to doctors, including deep X-ray plants, radio-isotope laboratories, and occupational and physio-therapy rooms.

The hospital has been designed by a London firm of Chartered Architects.

** ** **

NEW PLANT SOURCES FIND FOR CORTISONE

A strenuous search and subsequent careful research by United States Department of Agriculture (USDA). Scientists is likely to provide a new source for medicines used by sufferers from arthritis and related ailments. Two complex chemicals, discovered in the tubers of a rare Mexican yam, are showing promise as superior

raw materials for synthesis of drug cortisone, USDA has announced.

The two compounds are plant substances known as sapogenins. They are found in Mexico by a plant-exploration scientific team and are named for the two explorers who found them—designated as gentrogenin and corrollogenin for doctors H. S. Gentry and D. S. Correll of USDA's Horticultural Crops Research Branch. The yams, containing the chemicals were found during plant-hunting expeditions in a remote area of Mexico.

Chemical analysis found the two new substances in yams sent back to the United States by the Gentry-Correll expeditions. The analysis was carried out by Henry A. Walens, Samuel Serota and Monroe E. Wall, chemists of the Eastern Utilisation Branch of USDA's Agricultural Research Service at Philadelphia, Pennsylvania.

Dr. G. H. Hilbert, Director of Utilisation for USDA, says that the newly discovered plant chemicals are potentially much better as starting materials for the manufacture of cortisone by chemical means than any naturally occurring substance so far known.

When doctors Gentry and Correll had shipped the samples of yams from Southern Mexico to the

Philadelphia Laboratory for analysis, they also sent specimens of the same plants to USDA's plant-introduction garden at Glen Dale, Maryland. This forethought has probably saved a year or more in developing the medicines which are expected to result from the discovery. The plants are now growing at Glen Dale and will be ready in sufficient numbers for full field tests next spring. These tests will determine whether they can be cultivated as an economical source of raw materials for cortisone manufacture. Those in charge of all phases of the operation are anticipating success.

Cortisone and related drugs which have hormonelike action are widely used in the treatment of arthritis. The materials now used to make cortisone commercially come mainly from animal sources—chiefly ox bile, but also include the steroids diosgenin from better known Mexican yams and hecogenin from sisal plant grown principally for fibre.

The newly discovered Mexican yam steroids have an unusual value because of the presence in each of two desirable chemical structures—particular combinations of oxygen, hydrogen and carbon atoms—that usually occur only singly in most phases of nature. Previous plant steroids used for cortisone production have had only one of these highly desired chemical structures.

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Chest Injuries—and Iatrogenic Heart Disease

By DR. H. ARENBERG, M.D.

(Specially Contributed)

IT is now definitely established and widely accepted that cardiac trauma can result from injuries to the chest whether penetrating or non-penetrating. If cardiac damage is not manifest immediately after the injury to the chest, careful observation and follow-up studies including serial electrocardiograms may eventually uncover damage to the heart in some instances.

In most cases of chest injury where no cardiac trauma is detected after a careful study, recovery from the injury is complete. However it occasionally happens that during the treatment phase of the chest or during the follow-up when careful attention is directed by the physician to the chest or precordium unfavourable events ensue in certain patients. In such cases, seeds may be planted in the minds of individuals with psychosomatic tendencies that give rise to suspicion or fear that

there must be something wrong with the heart. This is more likely to happen in a clinic where less time is spent in explaining to the patient and discussing reasons for certain procedures or examinations, than in a private office.

Depending upon the individual make-up of the patient, concern about his heart develops. As the treatment of the chest injury and follow-up examinations with x-ray films and heat rays over the injured part continue, the patient becomes more sensitized a chain of symptoms soon appears, emanating from fear of heart disease. It seems that not even cancer arouses such fear as the suggestion that the patient might be suffering from a heart ailment. If a close friend or a relative should happen to have died suddenly of a heart condition, while he himself has been under observation or

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treatment, a real cardiophobia ensues in the hyper-sensitive or psychologically vulnerable person.

THE LITERATURE

According to Smith and Chapman, "Heart disease due to anxiety may be the result of an unwarranted emphasis on some equivocal finding in a susceptible patient. Being unduly concerned about himself already he may become obsessed with the fear of sudden death or a heart attack after being told he has a murmur or a fast heart".

It is well known that in some individuals, cardiac neurosis insidiously develops following rejection for life insurance because of a heart murmur or because of rejection by the Armed Forces for a similar reason. Wood states that Da Costa's syndrome may be induced by the physician or by any person of authority. In his series of 66 cases of functional heart disease, the physician was responsible for its development in 17 instances. Such neuroses, when definitely established

and not accompanied by objective evidence of organic heart disease, are grouped under the classification of Functional Cardiovascular disease with subtitles such as Da Costa's Syndrome, Effort Syndrome, Soldier's Heart, or Neurocirculatory Asthenia. One sub-group of functional heart disease is believed by many students of the subject to follow suggestion by the doctor and is consequently considered doctor-induced, etiologically. It therefore deserves special identity and is referred to as Iatrogenic Heart Disease.

Auerback and Gliebe in 1945 appear to have been the first to have written under this heading, although iatrogenicity in general had been recognized long before. In a scholarly paper on the subject Weinberg defines iatrogenic heart disease as an "illness in which symptoms referable to the heart or symptoms interpreted by the patient as such, are produced as a result of the words or actions of physician". The words or remarks taken by some patients too seriously are usually casual remarks such as "you have a slight murmur": "you have a skipped Beat" or "your heart is slightly enlarged

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or it is irregular". Such remarks made by the physician carry even greater authority when expressed following fluoroscopic examinations, or the reading of an x-ray film of the chest or an electrocardiogram.

THE CAUSES

The acts of the physician which may arouse the patient's concern about his heart include the manner in which he is examined and treated. Listening too long with the stethoscope over the heart arouses suspicion. Overtreating in length of time or frequency of visits in cases of chest injury, particularly if the injured rib of soft part is over the precordium, focuses the patient's attention on his heart. According to Weinberg "a vicious circle is thus established" where the fear and anxiety about the heart aroused by the physician's remarks or acts call for even more careful examinations and additional treatment with the consequence of an increased anxiety on the part of the patient.

In the course of a follow-up study of 250 cases of chest injuries previously reported, the writer himself

was inadvertently guilty of iatrogenicity. A number of the patients who had sustained various injuries to the chest wall and had been carefully studied for possible cardiac damage, began to be more concerned about the heart than about the original injury. Some inquired why so many "pictures" or cardiograms were made, or why the stethoscope was so frequently used over the heart or with the blood pressure apparatus. For most of these an ordinary explanation seemed suffice. But in other patients where concern about themselves pre-existed, the ground must have been made fertile for the development of iatrogenic heart disease.

Weinberg outlines the criteria for the diagnosis of iatrogenic heart disease: (a) The patient must have symptoms localized over the heart or precordium, (b) The symptoms must be traced to the fear of heart disease, initiated by words or acts of the physician (c) There must be no objective evidence of organic heart disease.

As impartial examiner for the U. S. Employee's Compensation Commission, the writer had occasion to

study cases of chest injuries where iatrogenicity was at least a contributory factor in the disability. To be sure, it is much more difficult to be on firm ground in the diagnosis of iatrogenic heart disease in traumatic cases than in non-traumatic. For in the former where the element of compensation or medicolegal adjudication is pending there is ample reason for subjective exaggeration. Nevertheless, with great caution and experience it is possible to evaluate with a considerable degree of certainty where malingering or exaggeration is the underlying motive and where a genuine cardiac neurosis or a fear of heart disease developed.

ILLUSTRATIVE CASES

Case 1

A stevedore, age 63, had his "chest crushed" by a case weighing 600 pounds. There were no fractures. He was treated with physiotherapy for seven months. He developed symptoms referable to the heart, namely precordial pain and palpitation. The examination was entirely negative except for a bursitis of the left shoulder. The electrocardiogram was negative before and after an exercise test.

Case 2

A 43 year old carpenter was struck over the precordium by a swinging draft. He treated with heat over the chest every other day for 14 weeks. While he lost no time from work, he began to have symptoms of precordial pain and dyspnea following a sudden death in the family from a heart attack. Examination, including x-ray of the chest and an electrocardiogram before and after an exercise test, was negative.

Case 3

A longshoreman age 61, fell on the deck of a ship and struck the front of his chest. There were no fractures. He was treated with diathermy for 11 weeks, three times weekly. Following this, he was told that his blood pressure was high. Symptoms of cardiophobia developed soon after and continued. Examination showed a slight hypertension with no definite cardiac enlargement on fluoroscopy or 6-foot x-ray film. The electrocardiogram was negative. The urine, and eye grounds were negative.

Case 4

A longshoreman, age 42, fell and struck his chest against the hatch coaming. He sustained fractures of

the 10th and 11th ribs on the left side. He was treated with heat three times weekly for eight months. Six months after the accident he developed a fear that he might have injured his heart. Examination including a pre-and-post exercise electrocardiogram was negative.

Case 5

An electrician, age 50, was struck over the front of the chest with an iron cross bar. There were no fractures. He was treated for 10 weeks with heat, after which he developed precordial pain and dyspnea and sweats. Another three months of similar treatment did not improve matters. Examination was negative except for a slight hypertension. The electrocardiograms were within normal limits. The heart in size and configurations.

Case 6

A longshoreman, age 42, was struck over the chest by a swinging draft. There were no fractures. After six months of treatment he developed symptoms of palpitation, precordial pain and dyspnea with or without effort and referred to the heart as the seat of the symptoms. Examinations, including x-ray of the chest and an electrocardiogram was entirely negative.

Case 7

A Wincherman, age 46, fell into the hole of an anchor and struck his chest. He sustained fractures of the 8th and 9th ribs on the left side. He was treated with heat for 10 weeks and was disabled for seven months because he was convinced that "something was wrong with his heart as he had a murmur and skipped beats". Examination was negative except for an occasional premature beat in the control electrocardiogram.

COMMENT

In all the above cases the initial symptoms were localized over the area of injury and were not necessarily associated with, or referred to, the heart. It was after long period of treatment, in most instances too long, with incidental remarks by the physicians that the symptoms began to be referred to the heart, rather than to the local area of injury. Hence the reference to iatrogenicity. Now, since medicolegal claims were pending in all instances, it was possible that the symptoms were somewhat coloured for ulterior motives. However, the impression that prevailed was that a

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psychosomatic condition existed, that there was a genuine fear of heart disease, and that the symptoms were aggravated if not initiated by too long treatment and undue emphasis on the heart.

SUMMARY

Iatrogenicity or doctor-induced disease has been known for many years to exist. Iatrogenic heart disease can result not only from inadvertent remarks by the doctor to a neurotic patient in general practice but also can follow in certain instances of chest injuries. It occurs usually in individuals with psychosomatic tendencies who have been overtreated and where too much emphasis has been given to the cardiac area in the course of treatment for the chest injury.

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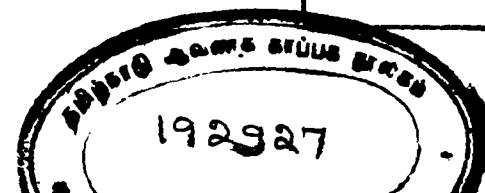
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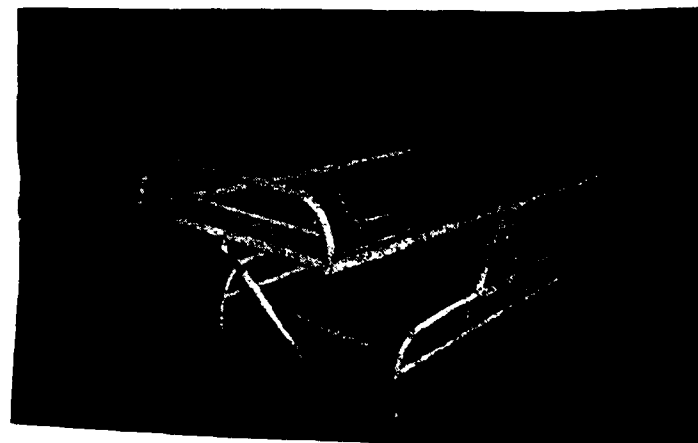
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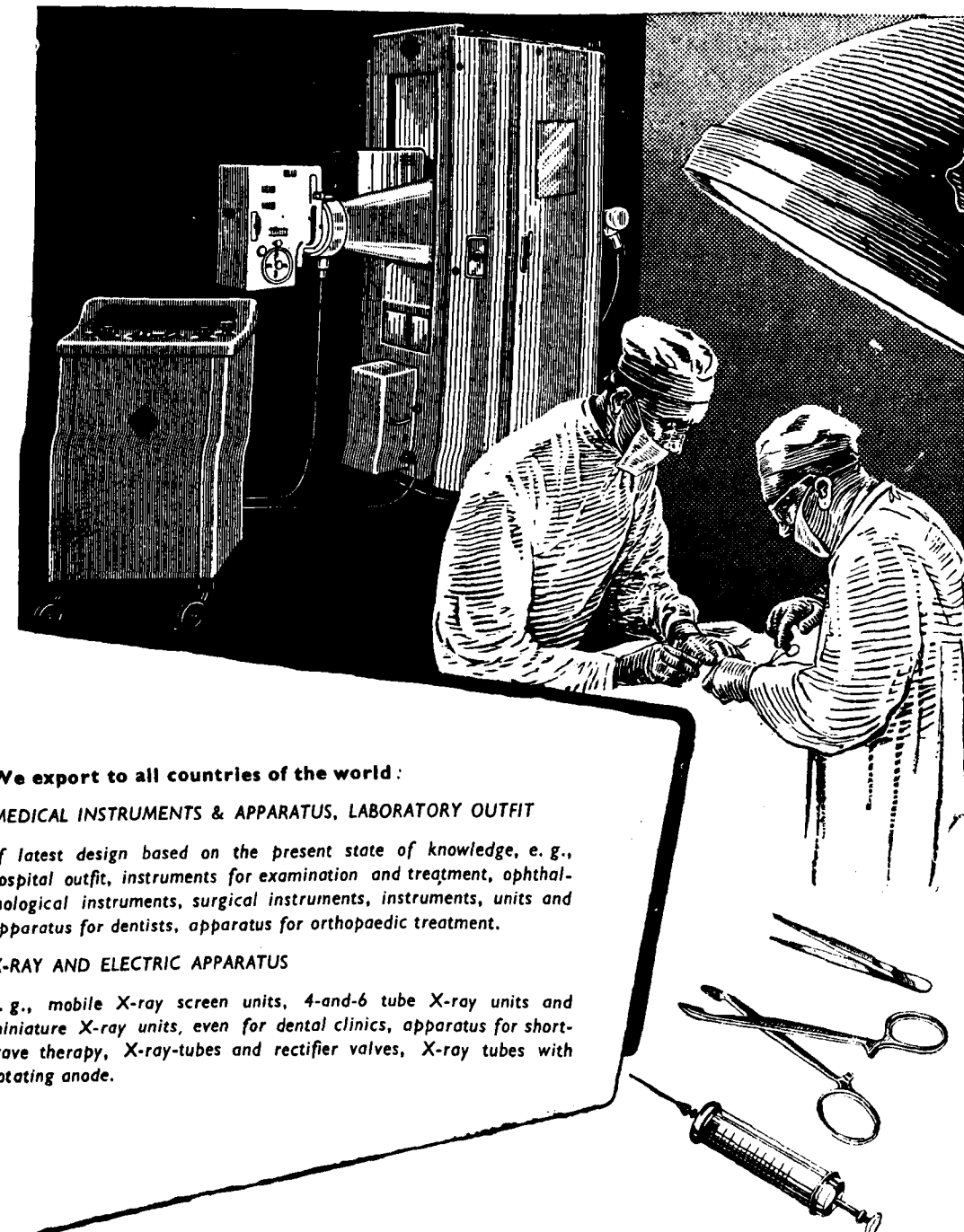


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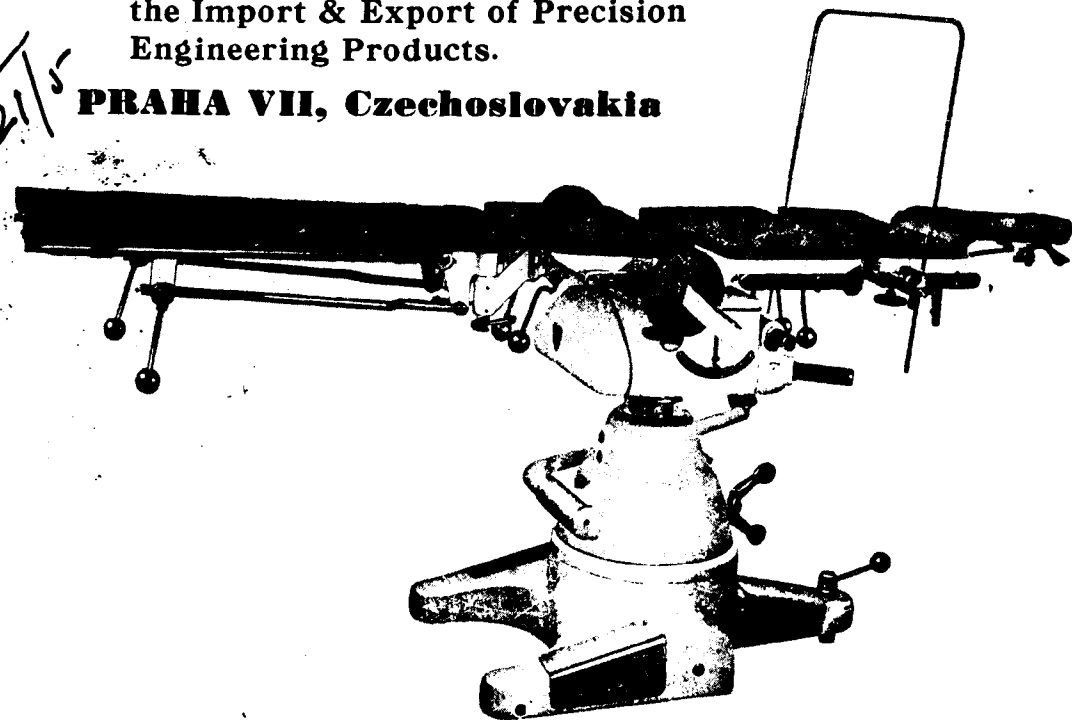
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