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A Monthly Medical Journal

EDITED BY

U. RAMA RAU, M.L.C.

AND

U. KRISHNA RAU, M.B., B.S.

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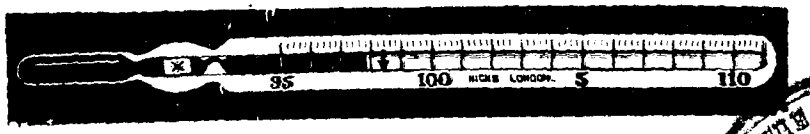

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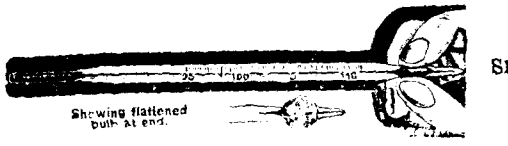

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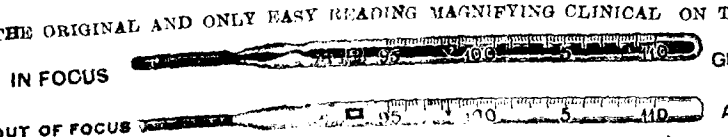

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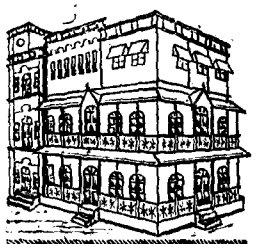

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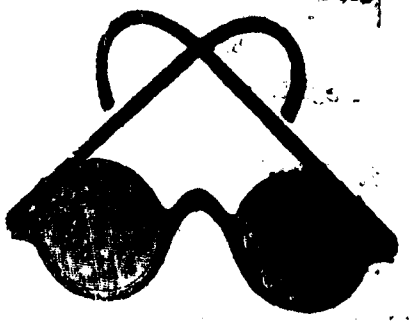

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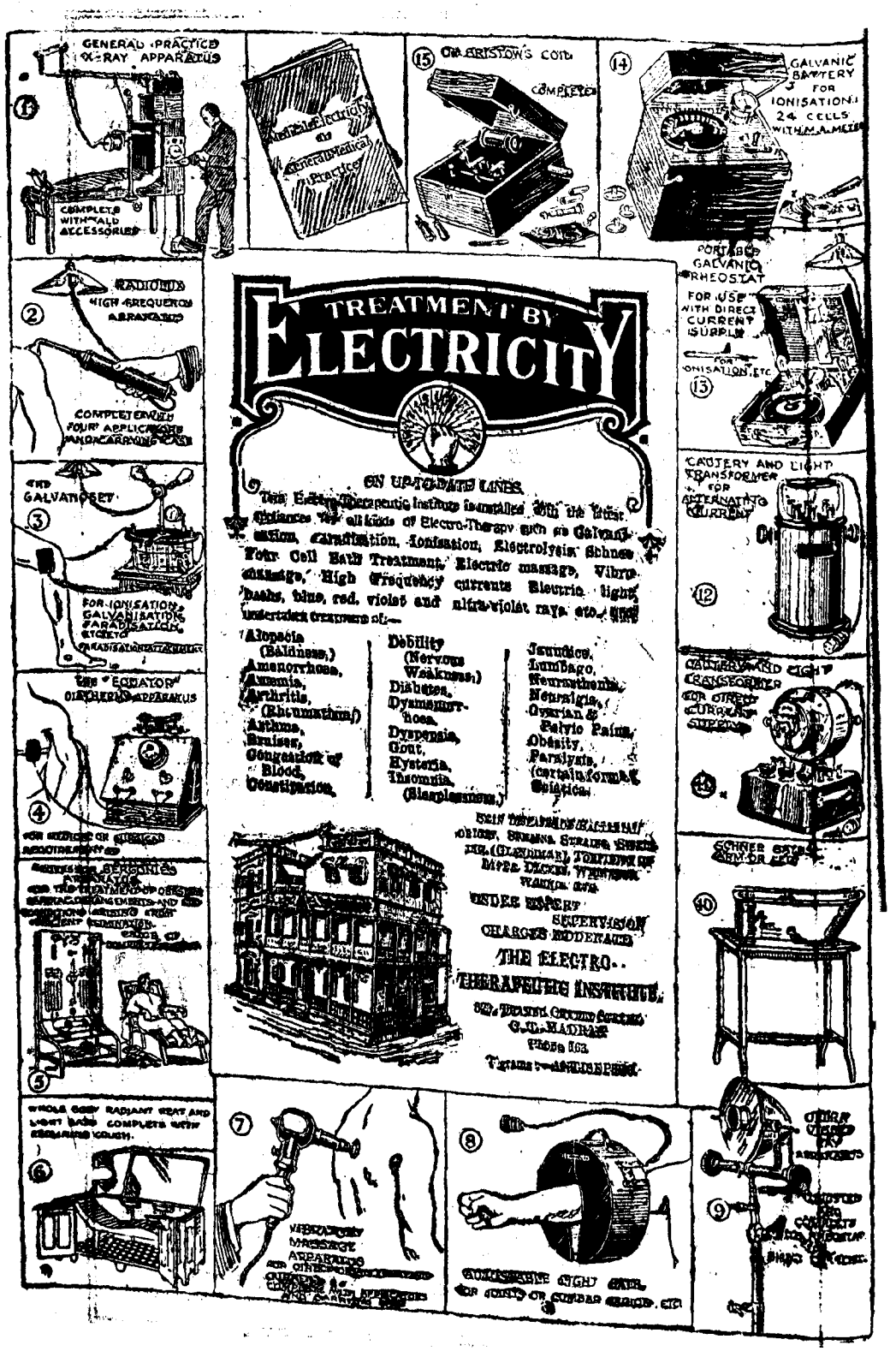

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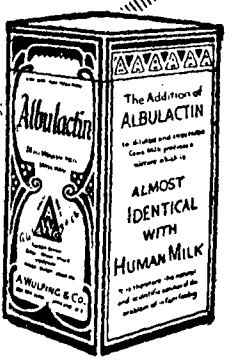

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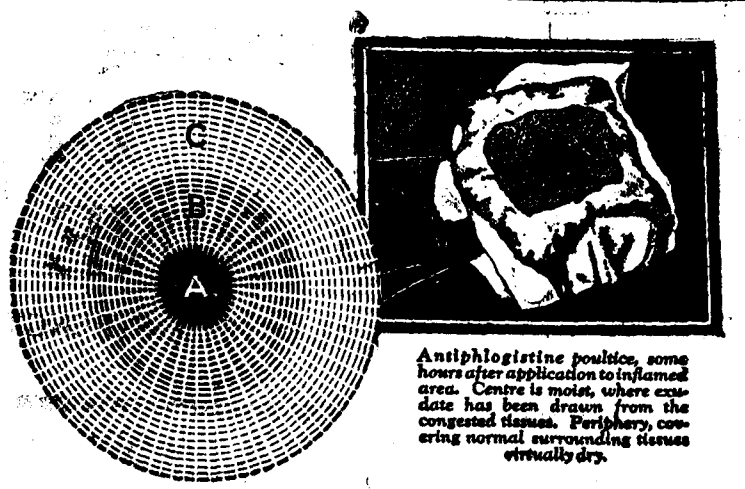

Antiphlogistine poultice, some hours after application to inflamed area. Centre is moist, where exudate has been drawn from the congested tissues. Periphery, covering normal surrounding tissues virtually dry.

This chart shows the Osmotic action of Antiphlogistine

DIAGRAM represents inflamed area. In zone "C" blood is flowing freely through underlying vessels. This forms a current away from the Antiphlogistine whose liquid contents therefore, follow the line of least resistance and enter the circulation through the physical process of endosmosis.

In zone "A" there is stasis, no current tending to overcome Antiphlogistine's hygroscopic property. The line of least resistance for the liquid exudate is therefore in the direction of the Antiphlogistine. In obedience to the same law, exosmosis is going on in this zone, and the excess of moisture is thus accounted for.

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Antiphlogistine stands alone as a non-toxic, non-irritant abstractor of fluid exudates in superficial inflammations. It relieves deep-seated congestion by inducing superficial hyperemia, through its inherent hygroscopic property, and without irritation.

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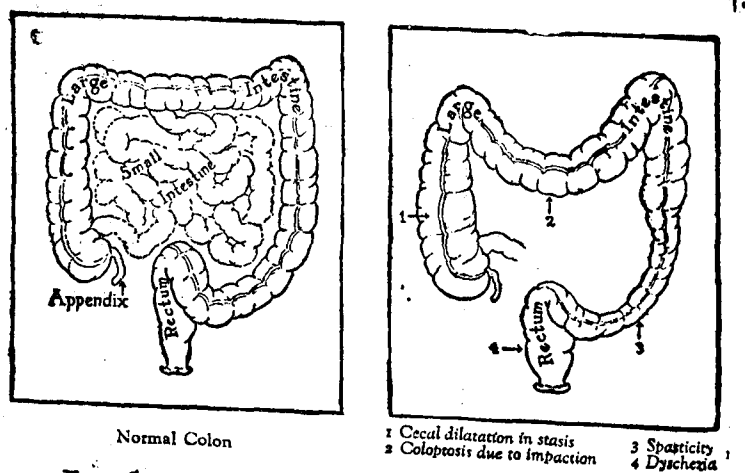

Normal Colon

1 Cecal dilatation in stasis
2 Coloptosis due to impaction
3 Spasticity
4 Dyschezia

Lubrication Therapeusis

AN authority of international reputation in intestinal diseases urges the use of a lubricant in treating the many forms of constipation. Laxatives of all sorts increase spasticity of the intestine, he says, whereas a lubricant protects the sensitive surface of the spastic bowel, at the same time softening and lubricating the intestinal contents so as to permit passage through the bowel without mechanical irritation.

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Nujol will not cause violent peristaltic activity as do cathartics and cannot be acted upon by the digestive juices or absorbed by the system. Every drop of Nujol that enters the body passes out of the body by the intestinal tract. Nujol protects the delicate lining of the intestine, spreads over irritated or abraded spots and gives them an opportunity to heal.

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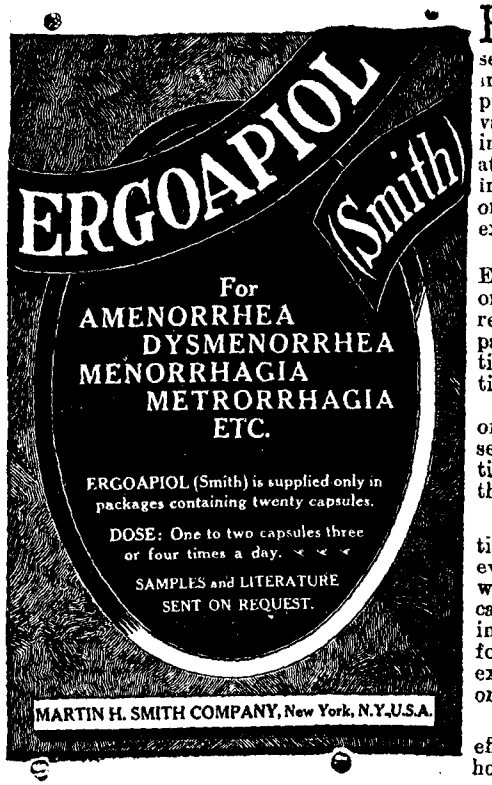

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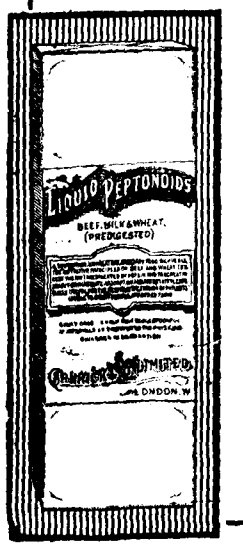

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The Antiseptic

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ORIGINAL ARTICLES.

*INTERNAL SECRETIONS

By

KSHETRA MOHAN GUPTA, M. B., M. R. A. S., CHIEF MEDICAL OFFICER, RAJ HOSPITAL, MOHISHADAL.

The widespread interest and intensive study of the internal secretions is of relatively recent date. Egyptian, Greek and Roman medicine all included beliefs and practices which were in their fundamentals related to the modern theory of internal secretions. The Indian Ayurveda of 1800 B. C. contains references to it. Galen regarded a faulty mixing of proportions of the four juices (Gall, Phlegm, blood and pancreatic juice) of the body as the cause of disease. In Ayurveda too we find the theory of three Humours (Bayu, Pitta and cough – Bayu = Nervous and circulatory system, Pitta = Digestive system and cough = General moisture including all the secretions of the body). All diseases are due to hyper or hypo functions of the said humors. These theories are the forerunners of present-day theory of internal secretions.

Legallois in 1801 A.D. suggested that the blood undergoes changes as a result of acquiring substances from the organs through which it passes. In 1855 Claude Bernard coined the words "Internal Secretions" as distinguished from external secretions. In 1856, the first work by M. Schiff of thyroidectomy in animals was performed, and suggested internal secretion effects. In 1889, Charles Edward Brown-sequard announced the rejuvenating effects of the injection of testicular extracts in his own person. He was however much ridiculed. He stated in a paper "All the tissues have a special internal secretion and so give to the blood something more than the waste products of metabolism". To-day the internal

*Specially contributed to "The Antiseptic".

secretions are regarded as a means of maintaining a harmonious inter-action between the various cells, tissues, organs and parts of the animal body. The organs which are thus classified as giving definite internal secretions, are the Pancreas, Pituitary, Thyroid, Parathyroids, Adrenals, Gonads, and the Duodinum. Those having an internal secretion about which less is known are the Prostate, Spleen, Kidney, Liver, Mammary Thymus and Pineal. To-day there is believed to be a close relationship between the nervous system and internal secretion mechanism, particularly the vegetative nervous system.

Terminology :—The organs producing internal secretions are called "Endocrine Glands". It is a Greek word with "Endo" meaning "within" and "Krino"—I separate out. It replaces the older term "Ductless Glands" which was unsatisfactory for the reason that some of the internal secreting organs have both an internal and external secretion, and hence do have ducts. The internal secretions themselves are called "Hormones". It is also a Greek word meaning "I arouse" (Hormao-larouse). Schafar has suggested the word "autocoid" (Greek Auto = self and Akos—a drug) in place of Hormones because internal secretion does not always stimulate but frequently also inhibits certain physiological actions. Autocoids are divided into two classes: "Hormones" which stimulate or increase and "Chalones" (Greek: chalao = to make slack) which depress activity. A very acceptable term has become current in the German—namely—"Incretion".

Action :—There are two modes of action (1) Direct action on cell metabolism. The action may be general and affect the metabolism of all cells (Thyroid) or specific and affect only certain types of cello (Pituitary). Most of the Hormones are of the latter type. There is a specific cell "receptor" for the Hormone on the tissue of selection. That Hormone action is one of catalysis is assumed from the minute quantity necessary to produce its effects. The hormones are not enzymes and do not produce their effects by virtue of such properties. (2) The second mode of hormone action is through the medium of the vegetative nervous system. The function of the rapid adjustments of the body is almost wholly one of the central nervous system, but in the more slowly effected vegetative functions the vegetative nervous system and the internal secretions constitute the essential mechanism. The toxicity or irritability of the vegetative system is regulated through the endocrine organs.

The vegetative nervous system :—This system is divided into two general divisions: the sympathetic and the para-sympathetic. (a) The sympathetic portion comprises a chain of ganglia lying on each side of the vertebral column, in the thoracic region, one ganglion for each vertebra, and extending from the first thoracic to the fourth or fifth lumbar vertebra. In the cervical region on each side, there are three ganglia. From the sympathetic ganglia fibres pass by the way of the spinal nerves and the blood vessels for distribution to the skin, blood vessels, glands and abdominal and pelvic viscera. The chromaffin system, of which the suprarenal medulla is the largest single unit, is usually included as a part of the sympathetic system.

(b) Para-sympathetic portion consists of two parts:

(i) Bulbar, (ii) Sacral. Bulbar portion includes the fibres lying for the most part, in the vagus and also, in a lesser extent, in the third, seventh, ninth and eleventh cranial nerves and the sacral portion consisting of fibres, leaving the cord in the nerve trunks of the second, third and fourth sacral nerves.

Through the vagus, fibres are supplied to the heart, bronchi esophagus, stomach, intestine and pancreas. From the sacral portion the descending colon, rectum, anus and genital organs are supplied.

Between the sympathetic and para-sympathetic, there is in general a definite physiological antagonism. Thus the sympathetic

(1) dilates the pupils.
(2) accelerates the action of the heart.
(3) inhibits peristalsis, and the secretions of the salivary juices.
(4) Dilates the sphincter ani and bladder.

While the Para-sympathetic (1) contracts the pupil.
(2) inhibits the heart action.
(3) contracts the intestines, aids in the passage of intestinal contents, stimulates intestinal glandular activity and the secretion of the pancreas and salivary glands.
(4) causes contraction of the bladder.

This balanced action of the two parts of the vegetative system, intimately bound up with the internal secretions which effect all degrees of variation in equilibrium, is of the greatest interest to the Endocrinologist. The extensive physiological changes of the menopause are one example of a syndrome that is intelligible only through endocrine interpretation. With reference to the general effects upon metabolism, growth and development, there has arisen a classification of the glands into two general opposed groups: The classification of Falta is as follows:

(i) Acceleratory (catabolic—dissimilatory.)
(a) Thyroid.

(*b*) Hypophysis (Posterior lobe.)
(*c*) Chromaffin tissue (Suprarenal medulla.)
(*d*) Sex glands.

(ii) Retarding (anabolic—assimilatory.)
(a) Parathyroid.
(*b*) Hypophysis (anterior lobe.)
(*c*) Adrenal cortex.
(*d*) Intestinal glands.
(*e*) Thymus.
(*f*) Peneal.
(*g*) Insular part of the pancreas.

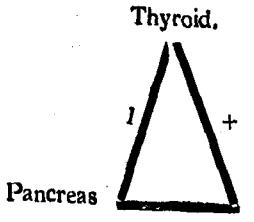
INTER-RELATIONSHIP OF THE ENDOCRINES.

(a) Thyroid and pituitary (anterior lobe) function for each other, though there appears to be no increased iodine content in the hypertrophied pituitary. Pituitary shows definite hypertrophy following thyroidectomy. Pituitary feeding or injection of pituitary extracts have been found to cause thyroid hypertrophy. Extirpation has been reported by some to cause thyroid atrophy.

(b) Gonad—Thyroid relation—Thyroid hypertrophies at puberty, menstruation and pregnancy. Also generative glands show defective development following thyroidectomy. Hypo-thyroidism is attended by decreased function of the gonads, frequently resulting in impotence.

(c) Pituitary-gonad—Gonads atrophy following partial ablation of the pituitary (anterior lobe). Pituitary feeding is reported by some to result in stimulation of the sex glands.

(d) Thyroid.—adrenals and panereas:—The pancreas inhibit the action of the thyroid and adrenals; the adrenals inhibit the pancreas and stimulate the thyroid; the thyroid inhibits the pancreas and stimulates the adrenals. Relations well shown diagrammatically by Falta as follows.



(e) Adrenal gonad:—This relationship is indicated by the embryonic development; by hypertrophy (of cortex) during pregnancy and the breeding period and also in precocious sex development. Under development of the colex is found in infantilism. Feeding of adrenal substance over a long period results in hypertrophy of the ovaries and testes.

(f) Gonad-Thymus.—They are antagonistic. Thymus functions before puberty and its involution begins with puberty. In castrated animals, the thymus is large and persists longer than in normal animals.

	THYROID.		P
	Hyperfunction.	Hypofunction.	Hyperfunction.
Skin and Hair.	Skin—Soft, moist, increased perspiration. Hair—Luxuriant, fine.	Skin—Thick, rough, dry. Loss of Hair, Scanty growth and Brittle.	Skin—Dry. Thick wrinkled. Thick nose lips. Enlarged tor Hair—heavy grov heavy eye brows.
Skeletal system.	Smallbones. Thin tapering fingers.	Dwarfism—Small stunted deformed bones. Thick club like fingers.	Large Skelet Distortion of bone face, skull and epip Thick club fingers.
Nervous system.	Emotional. Tremor Insomnia. Restless, unstable. Heatflashes.	Imbecility. Dull. Lack of initiative.	Dull mentality. mental process. H ache.
Generative system.	Lowered sexual activity. Amenorrhœa.	Lowered sexual activity. Amenorrhœa.	Large sexual orgs Amenorrhœa. Lately of sexual desire.
Circulatory system.	Tachycardia. Irregular heart. Rapid breathing.	Slow heart action. Low blood pressure.	Voice—heavy tone.
Respiratory system.			
Metabolism and Teeth.	Increased metabolism, Indigestion. White well formed teeth. Lowered carbohydrate tolerance.	Lowered metabolism. Constipation. Increased carbohydrate tolerance Irregular and delayed dentition *Obesity*.	Increased basal m bolism. Lowe carbohydrate Toler Glycosuria. Te widely separated.
Diagnostic signs and prominent smyptoms.	Exopthalmic goiter. Gastrointestinal disorder. Tachycardia.	Cretinism. Backward children. Amenorrhœa. Constipation.	Acromegaly. Impot Tendency to Gian Amenorrhœa.

The most remarkable fact about internal secretions is that they are correla.

'ERNAL SECRETIONS.

	'ITUITARY.	ADRENALS.	
	Hypofunction.	Hyperfunction.	Hypofunction.
ened : and igue. v t h,	Skin—soft, delicate, dry. Hair—scanty growth; hair distribution of the opposite sex.	Hair—early development of heavy, coarse hair. Hetrosexual distribution. Eye brows meeting in the centre ; beard in woman.	Hair—scanty g r o Skin—Pigmented ; p cularly of genital or and areola of nipples.
o n. s of hysis	Small stature—Tapering narrow fingers.		
Slow ead-	Headache. Drowsiness. Apathetic. Retarded mentality.	Alert. Active. Increased reactivity of sympathetic nervous system.	Languid. Asthmic. of interest.
gans. loss	Sexual character of opposite sex. Small sex organs. Amenorrhœa.	Male sex character in females. Enlarged clitoris. Precocious sex development. Large breasts. Early potency and early menstruation.	Poor development o organs.
	Normal or slow blood pressure. Slow pulse.	High blood pressure. Increased pulse rate.	Low blood pres Shallow breathing.
ieta- r e d ance e t h	Lowered met a b o l i s m *Obesity*. I n c r e a s e d carbohydrate Tolerance.	Increased metabolism. Obesity. Digestive disturbances. Large canine teeth.	Loss of weight. t u r b e d carbohy metabolism. Pigm Teeth.
ence. itism	Low tempe r a t u r e. Assumption of characteristics of the opposite sexual development. Impotence. Asthma. Lack of physical and mental force and initiative.	Assumption o f t h e characteristics of opposite sex. High blood pressure. Obesity. "Infant Hercules." Early menstruation. Sexual precocity.	Asthma. L a c k physical and mental f Low blood pres Neurasthenia. Addi disease.

ted with one another—So called " Pluriglandular Syndromes ", and henc

VITAMINS AND FRUIT IN DIET

By

J. S. Purdy, D.S.O., M.D., C.M. (Aberd.), D.P.H. (Camb.), F.R.S. (Edin.)

"*The scientific discoveries in the field of nutrition are destined to be recognised as the most fundamental of the agencies that contribute to the health, happiness and achievement of man.*"—McCallum.

Man wants but little here below nor wants that little long.

Few people in these days realise how little are his requirements, or the requisites, or bare necessaries to keep body and soul together. Fresh air, water, sunlight, shelter and food are the necessities of life.

Primitive man lived very much as does his near relative to-day, the Anthropoid Ape, in a state of nature.

The fruits of the forest and the plants of the field sufficed to maintain health and strength.

Two animals possessed of enormous strength and akin to man, the *Ourang-outang*, and the *Gorilla*, whose teeth and intestinal organs closely resemble those of man, never eat meat but consume large quantities of leaves, fruits and nuts.

Although the teeth, jaws and intestines of man resemble much more those of herbivora than carnivora, and as a matter of fact anatomically and physiologically he would be classed as of the frugivora, the fruit and nut eaters, yet history and experience show that he is really like the pig and can be classed as of the omnivora.

In primitive people such as the Akkas of Central Africa, the arms are so long that as in Apes they nearly reach the knees.

The structure of the hands also indicate that man naturally is frugivorous.

Undoubtedly man has wonderful powers of adaptation as to food. Contrast the fat diet of an *Esquimo* with the diet, say, of a *Constantinople Water Carrier*, or Boatman, according to Sir Wm. Fairbairn the finest physical type in Europe, who lives on water, cherries, oranges, apples, pears, mulberries and other fruits and only occasionally fish, or the *Australian White*, who was until recently a notoriously heavy meat-eater, or the *Aborigine*, who, according to Sir Edgeworth David, "ekes out a precarious existence on a diet of lizards, grubs, spinifex, rats rabbits, together with certain edible herbs and berries."

The tallest and best built men I have ever seen, were Bokarans from Central Asia, whom I met during my sojourn at El Tor in the Sinai Peninsula in 1906, whilst in charge of the Hospitals at the Great Hedjaz Pilgri-

* Specially contributed to "The Antiseptic."

mage Camp, where 32,000 Mahommedans returning from Mecca were disarmed, disembarked, disinfected, and drafted into sections previous to being passed through the Suez Canal.

One could not but be impressed with the fine physique generally of these pilgrims, and with the fact that whilst the handful of European doctors, nurses, and officials fared sumptuously on three ordinary meals a day, these people lived sparingly on a primitive diet. We did not have a single case of appendicitis among this multitude, nor do I remember any case of cancer of an internal organ.

Col. Pottinger recently told me that the main diet of the Bokarnas consisted of milk, butter and barley.

During my time at El Tor occurred the Akaba Crisis, and we were not permitted owing to the unrest among the natives, to visit Mount Sinai.

The few pukkah Bedouins whom we saw, however, then impressed us as of as fine physique as the Australian Light Horsemen, later observed during the Palestine campaign.

These people live to-day much as their forefathers did in the time of the patriarchs. They live in a climate with excessively high ranges of tempe- rature, where droughts are an every year occurrence and yet their vigour and virility are proverbial.

Deformities are rare, rickets unknown, and the teeth unusually sound. The diet of these pastoral people consists mainly of milk, cereals, and dates with only occasionally meat.

Pomegranates and melons are largely eaten in the more settled portions of the Hedjaz and the Yemen in Arabia.

McCarrison records that the people of the State of Hunza in the Himalayas, live solely on wheat, barley, maize, fruits, especially apricots, goats' milk and butter, and goats' flesh is only eaten on feast days.

The people are unsurpassed in physique and freedom from disease in spite of the hard climate and lack of sanitation; appendicitis is unknown. They have an extraordinarily long span of life. They at least show that long life, perfect physique and endurance in spite of their primitive shelter are associated with unsophisticated food and primitive conditions.

It is also interesting to note that the infantile mortality in the west of Ireland—where the mothers living mainly on milk and potatoes breast-feed their children—is as low as 30 per 1000 births, the lowest in the world, and half that of Australia.

On reading recently in *Mr. Alma Baker of Perak's* Pamphlet on "De-vitaminised and De-mineralised Foods" that "three quarters of the socalled civilised world is ill and the remaining quarter of the world has

something the matter with it", I remarked the old old story, "The world is not as well as it used to be and never was."

As a matter of fact, however, there is no evidence of physical deterio- ration, the average span of life has been advanced ten years during the present generation and man to-day has excelled in feats of physical endu- rance and established records outdistancing those of earlier periods.

We do know, however, that a considerable proportion of people are below an optimum of health and efficiency, physical, mental and moral. Conscription in Great Britain and the United States during the later stages of the Great War brought to light some startling statistics. In the average out of every nine men of military age in Great Britain, only three were found fit; two were upon a definitely infirm state of health, three were incapable of undergoing any extra exertion, being practically physical wrecks, and the remaining man was a hopelessly chronic invalid.

Although heredity, or, as *Oliver Wendell Holmes* puts it "ability to choose one's grandparents" is the main factor in giving a child a bill of health, nevertheless environment and especially diet plays an important role. Even the poor health of those not reared at the mother's breast, is ascribed by *Karl Pearson* in his recent survey of 1600 babies to the inheritance of the weakened constitution of the mother unable to nourish her offspring. The health of the father and mother is stated to have more to do with the health of the child than the wages of the father, or, in manufacturing centres, the employment of the mother.

What is known to Anthropologists as Cunningham's Law is that there is a physical mean for every race, and no matter how far the people may depart therefrom, once transplant them to a favourable environment and in two or more generations they will tend to return to the physical mean. This is well illustrated in the physique of the people of the Dominions of Australia, Canada, New Zealand, and South Africa, the CANZACS. For the most part but one or more generations removed from original British Stock, or in the case of Canada and South Africa, partly French and Dutch, heights and weights of school children, cadets and soldiers, as well as prowess in the fields of war and sport, show that the British Overseas have more than recovered any physical deterioration which may have resulted from industrialism and urbanisation of the masses in the Mother- land in the thirties and later decades of the last century.

Huntington in his works on "Civilization and Climate" and "World Power and Civilization" makes out a very convincing claim that climate is the chief factor in the development of a nation. A mean temperature of 64°F., a mean humidity of 80 per cent, and frequent changes of tempera- ture are the best conditions for physical work. He shows that the people

who, like the Scotch, live under conditions of relative storminess become industrious, capable and successful.

McCallum, on the other hand, in "The Newer Knowledge of Nutrition" emphasizes diet as the prime factor in the development of a people. He ascribes, for instance, the virility and progress of the Canadians in contrast with the sloth, improvidence, and retrogression of the people of the Bahamas—both descended from a common loyalist stock who emigrated from the Northern and Southern States, rather than live under the Stars and Stripes—not so much to the highly stimulating climate of Lower Canada, in contrast to the mild and uniform climate of the Bahamas, as to the difference in diet.

The Bahamas produce, tamarinds, olives, lemons, oranges, limes citrons, pine apples, pomegranates, figs, bananas, melons, yams, potatoes, cucumbers, sugar, maize, and peas, or fruits and vegetables not unlike those of Queensland and the Northern Rivers District of New South Wales, but their bread and meat is imported.

The people of Lower Canada subsist mainly on cereals, peas, beans, potatoes, meat, milk, cream, butter and cheese, a diet similar to that of the people of Australia.

The National Diet.—With regard to the Australian National Diet D. T. Sawkin in a memorandum to the N. S. W. Board of Trade, states: "The average food supplies per head of population remain the most important factor in determining national physique. It is hard to avoid the conclusion that the comparatively superior physique of the Australian soldiers was built up on the liberal average diet of the decades before the war. Then the average gross supply of meat in New South Wales was 240 lbs. to 290 lbs. in contrast to the present (1922) consumption of 170 lbs. to 200 lbs. per man per annum. If this great change in the National diet is to stand for any considerable period, then a great change may be expected in the national physique.

Dr. Harvey Sutton showed that the standards of physique for boys in the schools of N. S. W. for 1911-1912 was maintained until 1915. He also showed that the more Australian in the make-up of the child the better the physique.

In the New Zealand Health Report for 1909, I recorded that the boys of Wanganui and King's School, Auckland, between the ages of 14 and 15 years, had an average height of 63 inches in contrast to 61·96 inches, the average height of boys of the same age at Marlborough College, England. It was also shown that whilst the average stature at the ages of 11 to 12 of boys in the Public Schools in England in 1813 was 54·98 inches, that of the cadets of the Auckland Schools and King's College was 56 inches at the

same age. With regard to weight the advantage was also to the New Zealander.

Even more interesting was the fact that a comparison between the boys of the Chapel Street School, Auckland, probably the children of the poorest parents of the largest N.Z. City, with the boys of Rameura, the wealthiest suburb, showed less disparity than has been found to exist between the measurements and weights of children of the poorer districts of English cities as compared with children of the more prosperous suburbs, and the boys of the English public schools.

Such a result was only to be expected in New Zealand, where there is not the severe handicap of poverty and lack of food as obtains in some of the congested centres of the old country.

Food Values.

Recent researches, more especially as to the necessity of accessory food factors known as Vitamines; the role of mineral substances, especially calcium, phosphorus, sulphur, and organic iron in the nutrition of the cells of the body; the splitting of proteins or flesh forming foods into no less than seventeen aminoacids; the influence of direct sunlight on growth and nutrition and probably some undiscovered factor in unvitiated air have not only revolutionised our ideas as to food values, but suggest that the broadcasting of this knowledge and its practical application would contribute more than any discovery of recent times to the health, well-being advancement and achievement of man. Equally true with the dictum that an Army fights on its stomach is it that "the fate of Nations depends upon how they are fed", and as my old teacher, Prof. E. J. Hamilton used to say, "It is better for a man to have a good stomach than a good head."

Whilst man does not live by bread alone such is still the main stuff of life, and at its best has been proved by actual feeding experiments to be a loaf made of whole meal with milk, and added calcium salts.

As far, however, as the health and longevity of the individual is concerned, second only in importance to being begotten of healthy long-lived stock or parentage, is the food of the mother during his prenatal life, and his diet in infancy. The first fundamental requisite to rear a healthy race is, of course, that children should be fed as Nature intended them to be, at the breast by mothers who have themselves been well nourished by a well-balanced vitamin and mineral containing diet of which fresh milk and fruit should be the chief constituents.

Instead of the consumption of milk being less than half a pint per head per day, there is a unanimous authoritative opinion that for the first six

years of life the minimum should be a quart a day and for the rest not less than a pint at least until 18 years of age.

The superior physique of the pastoral peoples of the past, as of the present, is chiefly due to a generous milk ration. One cannot visit the Hawkesbury District of New South Wales, without commenting on the fine physique of the people which undoubtedly is due in great part, at least as far as the earlier generation is concerned, to a diet of milk, maize, meat, fruit, and other fresh foods, rich in vitamins and mineral constituents, combined with a life in the glorious sunshine and fresh air.

One is sorry to learn that resort to the grocery store rather than to local farm produce and the feeding of whole maize to the fowls rather than to the children is not maintaining the fine physique of the Hawkesbury native.

Experiments in the feeding of cattle conclusively show that the vitality of the young depends on the character of the diet of the Pregnant Mother and the rearing of calves on their natural food.

Indeed it was such evidence on his farm at Seacliffe, New Zealand, which first directed Dr. Truby King's interest to the feeding of infants and led him to establish the Karitane Hospital, and ultimately to launch his campaign for the teaching of mothers how to feed their children —the success of which has easily placed N. Z. ahead, as to a low Infantile Mortality rate, of all the countries of the world. As a matter of fact, in 1917,. when on leave in London, I asked Sir Arthur Newsholme what he would consider the irreducible Infantile Mortality. He told me 40 per 1000. In 1914 he talked of aiming at a tenth of the 1000 births, as a desirable Infantile Mortality and hoped for a fifteenth, but New Zealand now has had for seven years a twenty-fifth, Australia a sixteenth.

The Nursing Mother should always have a diet such as will ensure a satisfactory composition of her milk for the infant. From cows fed on fresh pastures she should consume large quantities of milk, and salads in order to produce milk rich in vitamin content.

Mothers who subsist on tea, toast, sugar, and other scraps of food unfit for the elaboration of milk or whose diet is mainly milled cereals, meats and potatoes, cannot have other than rickety and ill-nourished children.

Protective foods, raw fruits, raw salad leaves such as lettuce, spinach, white cabbage, or Brussels sprouts, and above all fresh unpasturised milk, should be the main portion of the mother's diet. Teeth are developed and enamelled before they are erupted in the last months before birth. During infancy the permanent teeth develop under the milk teeth, therefore the

diet of the mother and infant should be rich in Calcium and Vitamins and even supplemented by Cod Liver Oil, otherwise the child may be handicapped right through life by defective teeth.

Until the second decade of the present century, physiologists spoke of food, as engineers do of the fuel of an engine. The value of a food was assessed on its chemical composition. The calorific value of a food was worked out, so much protein which with the organic and inorganic salts and water, was mainly for building up the tissues, and replacing waste in the cells; the carbohydrates or starches and fats, the chief energy-yielding and heat-producing substances, in which functions they may be assisted or even replaced by the proteins or even by alcohol. In this sense alcohol is a food although an uneconomical one, as it conserves the body's fuel reserve by reducing the need for drafts thereon, and thus allows the fat and carbohydrates to be stored for its replenishment.

However, we no longer assess the value of a food only on its chemical compositions, since Hopkins in 1912 published the results of actual feeding experiments on rats, thus making the direct appeal to Nature. Until small quantities of milk were added to the diet of rats fed on the requisite amount of purified proteins, curbo-hydrates, fats and mineral salts, they failed to grow or to reproduce.

There is evidence in plenty that the constituents of the body, proteins, fats, carbohydrates, salts and water when supplied in abundance paradoxically will not maintain life. There are certain constituents of the plant world that must be added to the diet if health, growth and life are to be sustained. The precise chemical coastitution of these accessory substances known as Vitamins, has baffled the most intensive research although much has been learned of their origin, distribution and physical and chemical characteristics.

Without these accessory factors in nutrition, to the secret of which we have not yet gained access, and which are not synthetized in the body, normal metabolism is impossible, whereas with vitamins metabolism and assimilation is assured, and the synthetic building of the constituents of the tissues from the 17 amino-acids of proteins with the carbohydrates, fat and salts is accomplished.

Mc Carrison comments, "Surely it would be difficult to conceive of factors in nutrition more important than these, which quantitatively are infinitesmal in amount as compared with other essential constituents of food."

The fact that the presence of these vitamins was only proved by their absence made some slow to accept all that was claimed for them, although recent research has disclosed the great importance of calcium, phosphorus iron and other minerals.

A deficiency of Vitamins with a lack of balance in the diet not only retards growth and nutrition, but is responsible for much of the gastro. intestinal ill-health, anæmia, neurasthenia and lack of general tone so prevalent in our cities to-day, makes people more susceptible to infection, and less able to combat the sequelæ thereto. Their complete absence causes so-called deficiency diseases, such as Beri-beri, Rickets, Scurvy, and Pellagra, all of which are rarities in Australia.

In designing dietaries we have to insure not only that the mass of the public is instructed in the need for eating fresh foods rich in vitamins but especially that the prospective mother and her child are adequately provided therewith.

Vitamins although not tissue builders in themselves or energy producers, are actually the spark so to speak which ignites the fuel mixture.

Exceedingly minute quantities in certain conditions have produced extraordinarily great and dramatic results. Among the Sydney City Council employees, I have seen a course of fresh yeast, milk, codliver oil, lettuce, or oranges have a marked effect in getting rid of boils, assisting in promoting more rapid healing of wounds, and in under-nourished youths induced to give up cigarette-smoking, a remarkable increase in weight—one case putting on 7 lbs. in three months.

Produced in the plant world by simple unicellular cells such as yeast, it was at once thought that they could not be elaborated or stored in man or animal, and in this regard we were said to live a hand to mouth existence.

Considerable amounts of a Vitiman A. soluble in oil may however be stored in the liver, spleen and other glandular organs. As a matter of fact rickets in carnivora such as lions in confinement is prevented when whole animals are used as food, whereas it was common when the glandular organs were omitted.

VITAMIN A.

Sources of Supply:—Whole fresh milk, butter, animal fats, unrefined codliver oil (which is more richly endowed with Vitamin A. than any known food except possibly the oil of the Mutton Bird or Booty Petrel of the Islands in Bass Straits (Tasmania), and Stewart Island N. Z.). Twenty-four years ago I drew attention in the Australasian Medical Gazette to a successful experiment of feeding cases of Phthisis with Mutton Birds. In 1913 whilst spending six weeks in Flinders Island and Cape Barren Island, I ascribed an increase of 5 lbs. in weight to a diet of mutton birds.

Mr. Jephcott, who visited Australia in 1919 and had read my notes in the British Medical Journal of the previous year, agreed with me that probably increase in weight from feeding on mutton birds was due to them being rich in Vitamin A.

The food of the Booty Petrel consists of minute organisms similar to that of the cod which secretes an oil 250 times richer in Vitamin A. than butter.

Fish like mammals, probably derive the whole of this Vitamin A. either directly or indirectly from the vegetable kingdom, in their case from minute vegetable marine organisms such as diatoms and algae which contain this vitamin and which form the food of myriads of minute marine animalculæ which in their turn are eaten by kinds of small fish, whose name is legion, and which are eaten by the cod and other fish, or by the Antarctic living migratory mutton bird.

Other fish oils and especially whale oil also contain Vitamin A which probably accounted for the benefit some of the A.I.F. obtained from eating the frozen whale oil served out for smearing and rubbing the feet in the trenches in the winter in Flanders 1916—17 .

Liver, kidneys, sweetbreads, brains, fish, roe, and such like cellular organs have the two water soluble vitamins B and C as well as the fat soluble A especially.

In Nature green leaves in which active assimilation is taking place are the chief source of this Vitamin. Fruits, tubers, roots and seeds contain comparatively little of it.

The amount of vitamin in milk varies with the diet of the animal, and animals deprived of this factor are only able to rear their young for a comparatively short period.

The recent report (1924) of the Medical Research Council on "The Present State of Knowledge of Accessory Food Factors (Vitamins)" states that Vitamin A. is synthetized by the plant; that its production although dependent on light, is independent of carbon dioxide, oxygen, and chlorophyll; that nothing definite is known of the part it plays in nutrition of plants or animals—although in the latter its physiological function appears to be related to the metabolism of fats, calcium and phosphorus; that considerable amounts may be stored in the animal body, perhaps with reserve fat supplies, and that different species of animals differ in their need for it.

VITAMIN B.

This water-soluble anti-neuritic vitamin possesses especially preventative but also curative properties in such diseases or conditions due to its deprivation, as Beri-beri, lack of appetite, retardation of growth and lack of general tone. The main sources of supply are the germs of seeds, yolk of eggs, yeast, peas and beans, liver, kidneys sweetbreads, brains, fish roe, green vegetables, and fresh ripe fruits. It is claimed that the proprietary food "Marmite" and certain yeast preparations are rich in this vitamin.

ANTI-SCORBUTIC VITAMIN C.

The main sources of the water soluble Vitamin C are the green leaves of plants, such as lettuce, spinach, white cabbage, uncooked or steamed, and fresh fruit especially orange and lemon juice. This vitamin is created during the germination of seeds. Milk is relatively poor in this vitamin and when heated it is entirely lost. For this reason it is essential to add orange juice, tomato juice, or swede turnip juice which are all rich in this vitamin, to pasturised, boiled, condensed, concentrated or dried milk, especially when unfortunately infants are artificially fed. These anti-scorbutic juices are best given diluted with twice their amount of water between feeds—a teaspoonful daily for a baby one month old, increased to a tablespoon at three months.

Fruit juices may be dried by evaporation in vacuo or mixed with corn syrup by the "spray process" without much loss of the anti-scorbutic vitamin for as long as two years. Commercially dried lemon juice (raw and neutralised), tomato juice, grape-fruit juice, and orange juice were found by Givems and McClugaga in 1921 to be all active after fourteen to twenty months, whereas grape-fruit juice and raspberry juice were inactive.

Dried tomato was found to be active in doses of 1 grm.

This vitamin although present in muscle and tissue is apparently not to any great extent stored in the animal body as is Vitamin A; thus a previous period of large doses of orange or neutralised lemon juice does not affect the time necessary to produce scurvy in guinea pigs or monkeys when supplied with a diet deficient in this vitamin. Although the daily requirements of these two animals are the same, the guinea pig acquires scurvy in three weeks and the monkey in two months.

Anti Rachitic Vitamines.—Recent research more especially by Prof. Mellanby has demonstrated that the so-called Vitamin A. necessary to promote growth is not the same as the fat soluble anti-rachitic vitamin concerned with the calcification of bone which has an inter-action with the calcium and phosphorus of the diet.

A deficiency of calcium or phosphorus, or an unbalanced proportion of these elements relatively to one another, in conjunction with deficient anti-rachitic vitamin, hastens the development of rickets.

Prof. Mellanby recently pointed out that although intrinsically Vitamin A. is of greater importance than any other element of the diet which is essential to life, circumstances have assisted in bringing about a state of affairs so that a deficient intake of this vitamin has become of serious import in the natural life. In the first place, the distribution of the vitamin is restricted to a comparatively few foods, such as milk, eggs, green vegetables,—and these protective foods are often dear and difficult to procure. Secondly, the element calcium with which Vitamin A. works in conjunction, is also deficient in the average in diet. Thirdly, cereals which are cheap and therefore form a large part of the dietary, contain some substance or substances which actively antagonise the action of the fat soluble vitamine in some important respects. Finally the climate of Great Britian and especially the lack of sunshine, is such that one requires relatively large quantities of the vitamin to bring about normal development and health.

An interesting observation that the anti-rachitic action of whole milk has been found to vary with the diet of the cow and the degree of exposure to sunlight shows the advantage of residence in Australia with its abundance of sunlight and the ease with which milk from pasture fed cows is procurable. Thus Miss Luce found that when a cow was pasture-fed and exposed to sunlight 2 c.c.m. of its milk had the same anti-rachitic action when tested on rats as 15 c.c.m. of milk of the same cow fed on a diet of white maize milk, gluten meal, oats, barley and mangolds, and kept in a dark stall.

It was also found that puppies of bitches poorly supplied with anti-rachitic vitamin during pregnancy and lactation, especially when associated with excess of cereal, develop rickets more easily than when the maternal diet includes a liberal supply of vitamins especially in the form of codliver oil.

Mrs. Mellanby has demonstrated that the structure and arrangement in the jaws and teeth of animals depend mainly on their nutrition during the period of development. Milk, eggs yolk, codliver oil, suet and green vegetables, favour the production of perfect teeth, while cereals, especially oatmeal, tend to the production of badly formed teeth and teeth more liable to caries.

Prof. Mellanby states that the actual feeding experiments "Have completely changed the point of view as to the causation of dental defect, for previously all attention has been directed to the action of bacteria and their end products externally on the teeth and the tooth brush has been the great standby." It has proved but a bruised reed. It will be realised from this how very important, even considered from the point of view of teeth alone, are the calcifying vitamin and the substances with which it reacts.

Deficiency of this same anti-rachitic vitamin also leads to flabbiness and lack of tone of the muscles.

Light.—The most wonderful recent discoveries perhaps with regard to nutrition are the effects of the ultra-violet rays of the sun or of a mercury vapour lamp, as illustrated by their curative effect on rickets as demonstrated by Huldschinsky, Sarriatt, Chick, Elsie Dalyell, and others

who showed that exposure to those rays could be measured in terms of codliver oil.

It is now known that the ultra-violet rays are not a substitute for the anti-rachitic vitamin but bring into activity the fat soluble vitamin already stored in the body.

Just however as Vitamin A. and certain cereals are opposed in their action on bone and muscle, so Prof. Mellanby claims that the light effect is antagonised by cereals. As far as diets of moderate defect are concerned the addition of Vitamin A. in large quantities as by adding codliver oil to the diet is more potent than the stimulation to activity by light of the supplies already in the body, thus the infants of mothers on the Island of Lowes who are practically brought up in the dark, do not suffer from rickets because the mothers get abundance of oil from eating the heads of the fish they are curing. Thus sunlight whilst increasing the value of the anti-rachitic vitamin cannot entirely replace it or make up for a really defective diet.

Prof. Mellanby concludes that diets ought to contain as far as the preventative and curative treatment of conditions affecting bones and teeth are concerned, an abundance of fat-soluble vitamin and calcium without excess of cereals and especially of oatmeal, as well as having the other qualities of what is usually regarded as a good diet.

Specimen diets given as corrected by Prof. Mellanby are as follows:—

Child 3 Months old.—Milk 16 Ozs. diluted with water.
8 Ozs.
Egg ½
Codliver Oil ½ Teaspoonful twice a day.
Orange juice ½ Teaspoonful twice a day.
3 hourly feeds.

Child 5 Months old.—Milk 25 ozs.
Egg 1
Marmite 1 Teaspoonful
Codliver oil 1 Teaspoonful twice a day.
Orange Juice 1 Teaspoonful twice a day.
4 feeds during a day
1 feed early morning.

Child 9 Months old.—*Breakfast.*
Milk 7 Ozs.
Lunch
Milk 7 Ozs.
Bread ½ Oz.

Codliver Oil 1 Teaspoonful
Orange Juice 1 Teaspoonful
Dinner
Scraped raw meat ½ Oz.
Potato ½ ,,
Rice Pudding
Marmite 1 Teaspoonful.
Codliver Oil 1 Teaspoonful.
Orange Juice 1
Tea.—Milk 7 Ozs.
Egg 1.
Supper.—Milk 7 Ozs.
Codliver Oil 1 Teaspoonful.
Orange Juice 1 ,,
Milk 36 Ozs. in 24 hours; water ad. lib.

Diet for Adults.
Breakfast.—Milk ½ pint.
Bread 3 Ozs.
Egg 1.
Butter ½ oz.
Codliver Oil—1-3 Teaspoonsful.
Dinner.—Meat or fish 3 Ozs.
Potatoes 4 ,,
Green Vegetables 4 Ozs.
Milk Pudding.
Half an orange.
Codliver Oil 1-3 Teaspoonsful.
Tea.—Milk ½ Pint.
Bread 3 Ozs.
Egg 1.
Butter ½ Oz.
Jam.
Codliver Oil 1-3 Teaspoonsful.
Supper.—Milk ½ Pint.
Bread 2 Ozs.
Add. Calcium carbonate 10 grains thrice daily.

A warning is added with regard to codliver oil as both children and adults may be upset when the doses are larger than two teaspoonsful thrice daily.

Combined dietetics and light treatment in fractures and bone diseases has resulted in general improvement in the condition of the patients.

The fact that Rickets is comparatively rare in a marked form in Australia, is mainly due to our abundant sunshine as well as the fact that few children have a diet very deficient in the anti-rachitic vitamin.

Fruit as a source of Vitamins.—Fruit juices, generally speaking, are sources of all three vitamins and in particular anti-scorbutic Vitamin C.

In 1734 Bachstrom who traced the cause of the terrible scourge of Scurvy, so disastrous to seamen, to the absence of fresh foods especially juicy fruits and vegetables, wrote—" Where persons either through neglect or necessity, do refrain for a considerable period from eating fresh fruits of the earth and greens, no age, no climate, or soil are exempt from the attack."

In 1755 Dr. James Lind, who eight years previously had demonstrated the efficiency of oranges and lemons in curing cases of Scurvy on the "Salisbury" at sea, wrote "Armies have been supposed to lose more of their men by sickness, than by the sword, but this observation has been more than verified in our fleets and squadrons where the scurvy alone during the last year proved a more destructive enemy, and cut off more valuable lives than the united efforts of the French and Spanish arms."

BACHSTROM and later LIND'S conclusions as to the cause and cure of scurvy are in accord with the findings of the Medical Research Council in its 1924 Report to the Privy Council on Vitamins.

Although Lind's work received no public recognition, seventeen years later Captain Cook was awarded the Copley Medal of the Royal Society for maintaining good health and freedom from scurvy among his seamen on long voyages.

As Captain W. J. L. WHARTON says in the introduction to Captain Cook's Journal: "Ever present in each Captain's mind was the dread of the terrible scourge Scurvy. Every expedition suffered from it. Each hoped that they would be exempt, and each in turn was reduced to impotence from its effects. It was the great consideration for every leader of a protracted expedition. How can I obviate this paralysing influence"? One after another had to confess their failure. Thus Wallis in the "Dolphin" in 1766 had reached Tahiti with a crew decimated by Scurvy. Of the companionship "The Swallow", under CARTERET, who discovered Pitcairn's Island, there was a similar tale as to a stricken crew.

Besides the supply of all anti-scorbutics then known, a special letter was written to Cook directing him to take a quantity of malt to sea, for the purpose of being made into WORT as a cure for scorbutic disorders, as recommended by Dr. Mcbride.

In the Assistant Surgeon Dr. Perry's account of the voyage of the "ENDEAVOUR" it is recorded: "We passed Cape Horn, all our men as free from scurvy as on our sailing from Plymouth".

In addition to the malted barley, inspissated orange and lemon-juices, sour krout, and vegetables (at all times when they could be got) were some in constant, others in occasional use. "These were of such infinite service to the people in preserving them from a scorbutic taint, that the use of malt was (with respect to necessity) almost entirely precluded."

In the last voyage of four years and two months, it is recorded that not the slightest symptoms of scurvy appeared in either the "RESOLUTION" or the "DISCOVERY", so completely were Cook's precautions successful.

Captain WHARTON speaks of Cook's greatest triumph on the suppression of Scurvy:—"That it should be left to a man of little education to discern the combination of means by which this enemy of long voyage, could be conquered, is the most remarkable thing about this remarkable man."

It is evident that it is to Cook's personal action, the success was due. Wallis and Byron had anti-scorbution, but they suffered from scurvy; Furneaux sailing with Cook in the second voyage, under precisely similar circumstances, suffered from Scurvy. It was only in Cook's ships, and in the "DISCOVERY" commanded and officered by men who had sailed with Cook and seen his methods, that exemption occurred.

As to the actual discovery of the virtue of lemon-juice as a preventive of scurvy, it is interesting to note that in 1600 of the four ships which left England to establish the East India Company at the Cape, whilst in three of the ships one quarter of the men died of scurvy, the Commadore's own ship's crew was in perfect health, he having given three tablespoonsful of lemon-juice every morning to everyone on board.

It was not until 1795 that the Admiralty issued an order that every ship in His Majesty's Navy should have a supply of lemon-juice.

BUDD, writing in 1842, states "the effect of this order was remarkable, the mortality fell suddenly and to a degree that can scarcely be credited by one who has not read the heartrending accounts of the sufferings occasioned by scurvy on the voyages of Lord Anson and earlier navigators.

In 1840 we read that the Navy ration of 1 oz. of lemon juice daily afforded complete protection. Unfortunately the desire to develop our Colonial Trade and the idea that the anti-scorbutic virtue was due to acidity caused by the sour lime of the West Indies, which has little anti-scorbutic properties, to be substituted in 1860 for the sweet lime or lemon from Spain. This West Indian Lime juice deteriorates quickly and has failed repeatedly to prevent or cure scurvy as was the case with the Nares Polar Expedition in 1875-77 and the Captain Scott Expedition.

Scurvy now need have no terrors for explorers who are provided with orange and lemon juice or as in the case of STEFANSSON resort to the eating of reindeer, seal and bear meat occasionally raw.

Tomatoes are rich in all three vitamins and are best eaten raw; Oranges or orange juice is the most palatable and prolific source of Vitamin A. and C.

The Vitamin B. which is so plentiful in fresh Brewer's Yeast so valuable a stimulant to the appetite, is also well distributed throughout fruits; Orange and lemon juices are not only rich in A. but rank with fresh raw milk from cows fed on fresh pastures, clover, alfalfa, or timothy grass in being rich in B.

The Vitamin C. of which our main supply is the leaves of plants and fruits is usually destroyed by heat. Tinned fruits and tinned tomatoes, however, retain this vitamin, and the juice of tinned tomatoes is sometimes used as a substitute for orange juice for children fed on pastured milk; the dose for a child three months old, however, is as much as two tablespoonsful.

Fruit juices being acid resist heat better than vegetables, thus orange juice heated to boiling point still retains its vitamin virtues. Dried orange juice is now recognised as a valuable anti-scorbutic and even orange and lemon peel finely ground are useful in this regard.

In conjunction with Dr. Harvey Sutton, P. M. O. of the Education Department, I have recently endeavoured to induce the Fruit Grower's Association of New South Wales to make a weekly or bi-weekly supply of oranges to one of the City Schools with a view to repeating the interesting experiment of the relative value of oranges *versus* milk in the school lunch.

MARGARETS, CHANERY, in the American Journal of Diseases of Children, October 1923, relates how five groups of school children, 7 per cent. or more underweight, according to Wood's Standard, were required to eat the school lunch during two periods of 8 weeks, and were not influenced by change of home diet. Group 1 was given half a pint of milk and 2 Graham Crackers; Group 2, 1 orange of medium size and 2 Graham Crackers; Group 3 half a pint of milk and one orange of medium size; Group 4, quarter of a pint of milk, orangeade and 2 Graham Crackers. Group 5. the control group was given nothing. The periods were 23rd October to 5th December, and 8th January to 2nd March. The Group 3 was not continued in the spring study. The economic status of the homes permitted adequate food in the home.

That a mid morning lunch was of value in improving underweight children was demonstrated. The supplementary lunch of one orange and

two crackers as measured by gain in weight gave better results than milk and orange or milk alone. The percentage gain in weight of all the groups was greater than that made by the controls.

The conclusion was that milk, while producing favourable increase in weight, is not the only food valuable for the aid to be of marked value in stimulating growth in the underweight child, though not equal in value to fresh oranges.

Coincident with the research in Vitamins but somewhat overshadowed by the dramatic discoveries associated therewith, there has been considerable information gleaned as to the mineral constituents of the body, their source and importance in the diet.

There are twelve minerals in foods, the most essential being calcium, phosphorus and iron, which are derived principally from milk, vegetables and fruit.

The importance of a sufficient supply of Calcium is now recognised not only for the formation of bone, but for maintaining the coagulability of the blood and for the digestion of fats.

Most foods are poor in the element Calcium and it is necessary to supply this by foods such as milk, or the leaves of vegetables which are rich in Calcium. The Calcium requirement is a little over one-hundredth of the protein requirement.

The important mineral iron in which milk is deficient is found in such fruits as strawberries, lemons, oranges, grapes, cranberries pineapples, mulberries, blackberries, figs, olives, currants, dates, peaches, bananas, grape-fruits, apples, apricots, cherries, and above all in raisins.

Most sun-dried fruits are not only sources of vitamins but also rich in the valuable mineral salts. Raisins contain Calcium, magnesium, potassium, phosphorus, and iron in such valuable amounts that as Mr. Alma Baker says "Every athlete, every mother, every child, should cultivate the raisin habit as it increases the red corpuscles in the blood by its large iron content. If girls would make a habit of daily eating raisins they would discard the rouge pot."

Certainly as iron is chiefly assimilable in organic form raisins are better than the much vaunted Pills for Pale People,

Nutritive properties of fruit:—Although fruits are poor sources of protein and fat they contain sugar in varying proportions, and large amounts of water. They possess as a rule mild laxative qualities and also assist elimination of wastes by their diuretic properties due to salts of organic acids and their water content.

They possess an excess of basic radicles which render their ash alkaline. It is necessary to have a reserve of alkali in the blood to maintain

its capacity to carry carbon-di-oxide to the lungs for elimination. When this reserve falls below normal we get a condition known as acidosis.

The addition of fruits and vegetables to the diet tends to the establishment of a proper acid-base equilibrium in the various fluids of the body. Unfortunately, fruits contain little calcium, therefore a fruit diet must be supplemented by milk, salads or other calcium-bearing food,

The chief characteristics of fruit from a dietetic point of view, and as to palatability apart from their anti-scorbutic vitamin properties, are derived from their sugars and acids.

Different fruits contain different quantities of sugar, the grape may have from 25 to 30 per cent of sugar, apples 5 to 25 per cent.

The most common organic acids are Malic as represented in its highest quality in the apple, citric in the orange, and lemon, and tartaric in grapes.

The combination of the acids, bases, pectins and sugars in fruits, favour a natural progress of the food through the alimentary canal.

Fruit is best eaten in the raw state when it is free from decay and insect life.

The organic salts in fruit arouse the appetite and aid digestion by increasing the flow of saliva and gastric juice. As the fruit reaches the intestines, the acids increase the activity of the chyme and stimulate the secretions of the liver and pancreas, the intestinal glands and muscles. They render the blood less alkaline but never acid, and increase the phosphates in the red blood cells.

They are anti-scorbutic and of value in anæmia, general debility and convalescence from acute illnesses.

Fruits containing oxalates, as tomatoes, gooseberries and strawberries, are reported to be beneficial in Bronchitis and Asthma. Such as contain Salicylic acid, as strawberries, raspberries, currants, blackberries, and oranges are said to be indicated in Rheumatism.

Of the blackberry or bramble John Peachy in his Compleat Herbal (1694) records "that it is recommended for the Scurvy and not without reason, for in quality and figure it resembles the cloudberry and therefore we need not charge children so strictly not to eat them.

The final stage in the digestion of fruit is the conversion of the fruit acids and salts into alkaline salts chiefly carbonates. They are therefore useful in rheumatism and gout and all diseases of the uric acid diathesis. They increase the secretion of the urine and its alkalinity, stimulate the kidneys and the skin, and increase the excretion of salts and other materials.

During the war I thrice visited the Trappist Monastery at Mont des Chats near Bailouil and was struck with the fine healthy appearance, the fresh complexion and bright eyes of the Monks who live mainly on fruit and vegetables, milk and cheese.

The Apple, the "King of Fruits", contains potash, soda, magnesia and phosphorus in abundance, and is reputed to be an excellent brain and nerve food with tonic and laxative properties. Prof. Pickerrtgill of Dunedin has demonstrated that the acid of the apple is excellent for the teeth and gums—thus to the old adage, that "An apple a day keeps the doctor away," we may add, "An apple a day keeps the dentist at bay."

The banana the "bread of the tropics" shares with dates, figs, grapes and nuts high nutritive properties. It possesses when quite ripe 20 per cent. of sugar, and should be eaten when the skin is almost black. Although a valuable and nourishing food, the amount of protein is so small that about 160 would be required to supply the protein needed by a man of average build and energy. Even as a carbohydrate food their bulk diminishes their value, for about eighty bananas would be required to supply sufficient energy for an average man in a temperate climate. Taken with protein foods such as milk and wholemeal bread, the banana is a useful article of diet. Banana flour is equal in nutritive value to rice.

Pears, quinces, plums, damsons, peaches, apricots, cherries and grapes have a high percentage of carbohydrates and salts. In a "Grape Cure" several pounds are eaten daily and remarkable results have been claimed in certain wasting diseases. They contain glucose or grape sugar easily assimilated.

In the South African War, I suffered from the common complaint of Veldt Sores on the hands. An old doctor in Capetown advised me to eat a pound of grapes a day. Although grapes are said not to be rich in Vitamin C. I certainly found the sores disappeared after a few weeks on grapes.

In chronic Bronchitis, Heart Disease and Bright's Disease, grapes are said to be frequently beneficial.

Raspberries and strawberries being highly acid, clear the blood of uric acid and act as a tonic and stimulant. The strawberry also contains a large amount of iron, and is valuable in anaemia. Thus strawberries and cream is both an appetising and a nutritious dish.

Pineapple juice is said to have antiseptic as well as antiscorbutic properties and is reputed to be beneficial to diseased mucous membrane. Tinned pineapples and tinned tomatoes have acquired in Australia a reputation for preventing and curing Barcoo Rot a condition not unlike the Veldt Sore in South Africa, and the ulcer of the skin in Sinai.

Oranges have obtained a reputation in Influenza. Figs contain 60 per cent. of sugar and are not only very nutritious but possess laxative properties.

Dates are the great source of sugar in the fruit kingdom and contain valuable salts. One regrets that they are not produced in larger quantities in the Northern Territory.

Outside meat and legumes, nuts are the greatest source of protein. They are a perfect food, supplying proteids, fats, carbohydrates, and salts in a concentrated form with little water. They are the most valuable form of food next to milk known and the most sustaining and nourishing. When they form the sole element of the meal or with fruit, they are less liable to cause indigestion than when eaten with other foods.

Fruit should be eaten raw on an empty stomach or combined with nuts.

Sugar should not be added to fruits as it excites fermentation. On a diet of fruit and nuts the colouring of the skin improves, the complexion becomes clear and the eyes bright. The temper improves as there are no toxins to be eliminated.

Garrod recommends oranges, lemons, strawberries, grapes, apples and pears for gout.

A man not working out of doors and not taking exercise can live on fruits alone.

Oxen fatten on apples and pears, but at work requires grains and foods with proteid to effect the destruction of muscular tissue.

Especially in the tropics is fruit indicated. Dr. H. W. Kipping of the Physiological Institute of Hamburg in recent papers reviewed in "Le Lancet" under the heading "A Diet Scheme for the Tropics" points out that apart from disease, the great problem of the tropics is how to keep cool. He concludes that proteins should be taken only sparingly during the hotter part of the day, the main protein meal being arranged to occur in the cooler evening. Where fruits are plentiful the need for vitamins is supplied. The protein must not be supplied from a single source, as the right proportions of cystin, tyrosin, tryptophane and the like do not exist in every food. As to cellulose, Dr. Kipping holds strongly that there must be in the food some element, bulky, unabsorbable, and yet unirritating to increase the mass of the intestinal contents and by assisting peristalsis, to prevent constipation. This cellulose is easily obtained from fruits, salads and bread made from coarse flour.

After this evening protein meal, the office worker can be quiet in a long chair, not further raising by muscular activity his temperature, already slightly raised by digestion.

In Java, Dr. Kipping tells us, doctors not vegetarians in principle, took to living exclusively on vegetable food. He suggests the following for a tropical day. *Breakfast*—Tea or coffee, bread, butter, jam, pineapple or banana fritters, fruit. *At Mid-day* rice, (not too much) with vegetables,

salads, a little fish, fowl or egg; all to be nicely cooked, but taken in small quantity. In the *evening* comes the main meal. The moral of Dr. Kipping's articles is put briefly. Self denial at lunch will keep you cooler through the afternoon.

The practice of no lunch or a light lunch is one which should be encouraged. There was no one more energetic or fit with the A. I. F. than General Birdwood right through the campaign yet he made a practice of only eating two meals a day, and only on very special occasions, had lunch.

Canon Lyttlemen recently, in an address to the Kensington Division of the British Medical Association, stated "When he was 40 he found that many of his contemporaries were getting what was called the elderly spread, somebody told him a saying of Archbishop Temple, a magnificent specimen of an old man whose vitality continued to an advanced age—"The older you get the less you want.

Some ten years ago the late Sir Malcolm Morris told him that in his consulting room, he had been able to save the lives or the health of hundreds of men by giving them only the advice to cut down their diet."

Whilst no doubt it is true that many "men dig their own grave with a knife and fork", the general consensus of medical opinion is that a well-balanced diet is the best diet. The evidence of Nature experiment and experience, is to the effect that "the keynote of successful nutrition" as McCallum says, "is the selection of foods with unlike dietary properties so constituted as to supplement each others dificiencies."

Nutrition on scientific lines is more important in the prevention of diseases than any other contribution to preventive medicine in so far as it tends to raise the vitality of man.

This was illustrated in Denmark during the war where the diet consisted of natural food stuffs, bread made of whole rye, and wheat bran, and 24 per cent of barley, potatoes, barley porridge, greens, much milk, and butter. The death rate fell by 34 per cent.

HINDEHEDE, a Danish Physiologist, concludes that "the principal cause of death lies in food and drink".

Whilst we cannot choose our parents most of us in Australia can choose our food. If careful to include fresh milk from pasture-fed cows, lettuce, oranges, tomatoes and other vitamin and mineral containing foods, we need not worry much about what else we eat.

To maintain an optimum of health, especially in hot weather, people over forty especially are well advised to eat fruit for breakfast, at lunch and as desert at dinner, to make sure of getting enough iron, calcium, phosphorus, regulating acids, vitamins and cellulose.

At least one orange, one apple or some fruit should be eaten by every body every day.

The conclusion of the matter is that our best defence against disease is to build up our resisting powers by living as much as possible on fresh foods.

As a health insurance we require a well-balanced diet to eschew fads but to chew our feed and not forget to eat fruit.

DIATHERMY

By

P. S. K. CHARI.

Diathermy is a term introduced by Nagelschmidt in 1907 for the heating through and through of the body or a part of the body by passing through it a high frequency current. The current used in diathermy is often called D'Arsonval current.

The diathermy current may be employed either as a medical or surgical means of treatment.

MEDICAL DIATHERMY.

May be either general or local. General Diathermy is often called auto-condensation. General Diathermy is the raising of the general body temperature from ·5° to 2·5° F by the passage of a high frequency current.

PHYSIOLOGICAL EFFECTS OF MEDICAL DIATHERMY.

The warmth in Diathermy is produced within the tissues, within the interior of the body. When the diathermy treatment is applied as a general treatment or as a prolonged local treatment of a considerable area every cell of the body participates in the warming. The deeper the seat of the warmed cells, the slower is the loss of the stored up heat. The sympathetic system is stimulated. This is evidenced by the increase in oxidation and elimination, by increase in glandular secretions, by increase in Phagocytosis, by increase in physical and mental vigor. Diathermy produces heat necessary to normal function, to the restoration of altered functions to normal, to the repair of damaged tissues to the more successful repulsion and destruction of an invading enemy, without any expenditure of energy on the part of the heat-regulating forces of the body. There is a great change in the consumption of oxygen and the elimination of Co^2 before and after Diathermy.

Before	After
Oxy. consumed in 10" = 2·95 litres.	30" it 2·14 litres,
Co^2 elimination 2·64 litres,	30" 1·96 litres,

ESSENTIAL EQUIPMENT.

The requisites for diathermy are a good Diathermy apparatus, a condenser couch or chair, electrodes of various sizes, shapes and materials, conducting cords, clips for attaching the cords to and materials for holding the electrodes for local diathermy in place. Machines which give a relatively higher voltage that produce a current more nearly of the type of the original D'Arsonval current, seem to give the best results. A machine which gives a current for X-Rays is not necessarily a good machine for Diathermy.

Most Diathermy models on the market deliver a current sufficiently satisfactory for medical diathermy when supplied by alternating current of 110 volts. For direct current a Motor Transformer is employed to generate an alternating current to supply the machine. In this process considerable voltage is lost unless a special step up transformer is employed between the motor generator and the machine. The spark gap is the most sensitive and important part of the machine. It must always be kept clean.

THE CONDENSER COUCH OR CHAIR.

For the D'Arsonval current, a thick dialectric should be employed for the condenser couch. The Dialectric is the insulating material used between the metal plate of the couch and the patient. Their experiments also show that for machines of relatively low voltage and high amperage, a thin dialectric gives the best results. If the condenser couch is used the patient lies on the dialectric and holds in his hands a metal or non-vacuum electrode (glass). If the condenser chair is used the patient sits in the chair and places his hands in contact with metal plates or knobs on the arms of the chair. In any case one terminal of the diathermy machine is connected to the condenser couch or pad, or to the back of the chair and the other terminal of the diathermy machine is connected to a metal bar to be held by the hands. The patient for general diathermy should be dressed in loose clothing.

It is a good plan to take the blood pressure, the pulse and the temperature before treatment. In any case this must be done before the first treatment.

ELECTRODES FOR LOCAL DIATHERMY.

The most satisfactory material for Electrodes is of lead in thin sheets. This can be cut and moulded to fit any area to be treated. The size of the electrodes used will depend on the area to be treated and the depth beneath the skin at which the greatest warmth is desired. When the electrodes are of unequal sizes the larger electrode is referred to as the indifferent electrode and the smaller one as the active electrode.

How to apply the Electrodes ?

They should be so placed that the current will flow through the area to be treated. Electrodes should always be placed on opposite sides of the region to be treated and never both electrodes on the same side. In the latter case, the current would pass fron the edge of one electrode to the edge of the other and there would result only a warming of the skin. The current should pass from the surface of one electrode through the region to be treated to the surface of another electrode. If greater warmth is desired nearer one surface than the other the active electrode should be placed on that surface.

The electrodes should be so placed that the distance between their edges is greater than the distance between the centres of their surfaces, otherwise the major flow of current will be from edge to edge and little from centre to centre of the electrodes.

As more heat is produced along the flexor aspect of flexed joint, less heat will reach the interior of a knee when the patient is seated in a chair with knee bent than when lying recumbent with leg extended.

Holding Electrodes in Place.

In the application of large electrodes to anterior and posterior surfaces of the body the patient should be on pillows. Electrodes about the joints may be held in position by bandages. The smaller the electrodes, the more carefully must they be secured in place. Otherwise there will be a spark gap between the electrode and the skin and burning will result.

All electrodes must be moistened with liquid soap before being applied to the skin.

Never apply a dry electrode to a dry skin. Either cover the metal and skin with soap lather or use moist padding or wet with a saline solution.

It is inadvisable to use Diathermy during menstruation or in acute hemorrhagic conditions.

Regulation of Current.

When you start the working ask the patient repeatedly if any pricking is felt. If not, gradually increase the current flow to the milliamperage desired. Allow from one to five minutes between each increase in flow. If a high amperage is thrown on rapidly, the skin soon becomes very hot and but little of the current flow will reach deeper tissues.

Duration and Frequency of Treatments.

Dosage in diathermy is a thing that can be learned only by experience. In treating small areas with local diathermy the number of milliamperes of current should never exceed 106 m. amperes to the square inch of active

electrode. In most cases, the comfort of the patient is the best guide. The duration of a treatment will depend on the condition to be treated and on the patient. Treatments vary in duration from five minutes to one hour. Frequency of treatment also depends on the condition to be treated and the ability of the patient to come for treatment. In most cases, daily treatments are advisable at first, then thrice weekly, and later twice or even once weekly.

Heating of superficial tissues.

When it is desired to limit the heating to the skin or most superficial tissues a non-vacuum or a glass condenser electrode may be used for the active electrode. The gases of ozone and nitrogen formed in the region of the sparks from these condenser electrodes are germicidal in their action on the superficial layers of the skin. The diathermy current does not pass through the material of which the condenser electrode is made but charges are induced in the part with which the electrode is in contact.

Indications.

Medical Diathermy is not a panacea for all diseases. Yet, its indications are many. It is a most excellent adjuvant to many other therapeutic measures. And in many cases it is the indicated therapeutic agent par excellence. For, diathermy is heat and heat only. Diathermy furnishes the needed heat where it is wanted and when it is wanted without taxing the heat regulating forces.

Diathermy in Diseases of the Circulatory System.

Diathermy has a profound effect on the circulation. General diathermy tends to reduce hyper-tension and to raise hypo-tension to normal tension. Local diathermy causes a local dilatation of the blood vessels of the part treated. Blood from the surrounding healthy tissues rushes into the dilated vessels. This influx of healthy blood replaces the stagnant poisonous blood and increases cell metabolism and germ resistance.

Diathermy in Hyper-tension.

(1) Ascertain the cause first. If compensatory, don't reduce it. In this case treatment should be directed to renal, hepatic, cardiac, pelvic or other diseases of which it is a compensation. Many cases of hyper-tension 190 mm Hg—240 mm Hg—have been reduced by first treating constipation and mucous colitis which was the source of the toxæmia. In these cases after the bowel is cleared of debris and enterotoxins, diathermy may be employed—general diathermy by means of condenser pad or better still local diathermy through the abdomen.

In general Diathermy 400–800 mill-amp. are used during a period of 15—25 minutes. In Local Diathermy large electrodes are used and a

LOCAL DIATHERMY IN OTHER PAINFUL CONDITIONS.

(1) *Lumbago.*—Yields like magic to local diathermy. The indifferent electrode under the abdomen and an active electrode 5 × 7 in. over the lumbar regions. 500 mill-amp. are used. Every one to 3 minutes increase the current 300—500 mill-amps until a maximum of 2—2·5 amps is reached. Duration 20 minutes and then gradually reduce the current.

DIATHERMY IN INFECTIONS OF THE RESPIRATORY SYSTEM.

Diathermy is used with gratifying results in Pneumonia, Bronchitis, Empyema and pleural adhesions. It is also very useful in the local treatment of *Pulmonary Tuberculosis.*

Diathermy is given every alternate day. Large flexible electrodes are placed on the posterior and anterior surfaces of the chest and 1500 milli-amps. are given. Duration 45 minutes. The strength may be increased to 2000–2500 milli-amps.

DIATHERMY IN GONNORRHEAL URETHRITIS AND CERVICITIS.

Treatment twice a week. 10 minutes each time.

DIATHERMY IN MALIGNANT AFFECTIONS.

Great care should be exercised in using Diathermy in the treatment of cancer, for it must be remembered that low degrees of heat stimulate the growth of cells.

Conclusion.—

The time is past when it is necessary for a patient to suffer for days from a bone or joint trauma when it is necessary to expect a fibrous ankylosis as the sequella of trauma, of articular rheumatism or of dental infection. Medical Diathermy is a therapeutic means of increasing the general body temperature or any portion of the same within physiological limits by the passage through it of a very high frequency current. Yet it is not a panacea for all diseases; but it is the indicated remedy of choice. Diathermy is truly a wonderful hand maiden to medicine. Diathermy is destined to become quite as important to the surgeon and orthopedist as are splints and bandages. The layman now demands the X-Ray as a confirmatory diagnosis. He will soon demand Diathermy treatment in bone and joint lesions.

CASES AND COMMENTS.

DIFFERENTIAL DIAGNOSIS OF SCROTAL TUMOURS

BY

R. PRASAD SAKSENA, L.M.P., DHAROOPORE.

One of the commonest complaints for which the general practitioner and more especially the surgeon is consulted is *Scrotal Tumours.*

The fact that they may be due to any one or more of a variety of causes, that these causes are sometimes very difficult to determine, and that without an accurate and efficient knowledge of the cause, proper and radical treatment cannot be undertaken, justifies the necessary consideration of the diagnosis of scrotal tumours.

When a practitioner or especially a surgeon is consulted by a patient with such complaint, his first duty is to examine the patient and decide whether the swelling is purely scrotal or whether something descends into it from the inguinal canal and abdomen. This can easily be decided by grasping the cord immediately below the external ring. Side by side with this, the condition of the cord should also be noted carefully. Thus, if the cord is of normal size and consistency, hernia and diffused hydrocele of the cord are thereby excluded and so on.

(1) *Method of Examination:*—Note down the *history* of injury; whether the tumour is growing slowly or rapidly; history of consciousness and family history.

(2) *Swelling*, whether accompained with pain or without it, whether it is rough, nodular or smooth or pyriform etc.

(3) *Condition*, unilateral or bilateral.

(4) *Position*, whether it changes its size in different positions or is fixed

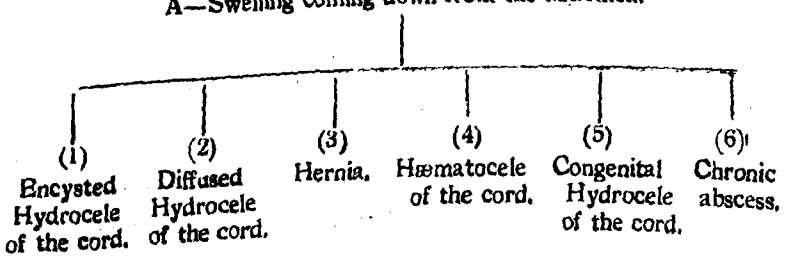
(5) *Testicle*, normal or enlarged, any suppuration or fluctuation; see also whether the swelling is affecting the body itself or the epididymis or both.

(6) *Cord*, (a) whether thickened, irregular, or normal, (b) any hydrocele etc. in connection with it, (c) size, whether changes in different positions or is fixed.

(7) Look for the *Inguinal and Lumbar glands*, whether they are enlarged or not.

Now if the swelling comes down from the abdomen it can possibly be:—

A—Swelling coming down from the abdomen.



slowly increasing current of 500—2000 mill-amp. is passed. The blood pressure will usually be found to be reduced after this treatment from 10—30 mm Hg.

DIATHERMY IN HYPO-TENSION.

This class of cases gives the physician more trouble than high B. P. cases. Diathermy gives the thermogenic mechanism a rest, by supplying the heat which the body cannot produce and thus permits it to resume normal functioning. Daily treatments of 15 minutes to one half hour should be given on the condenser chair or pad. 500-800 mill-amp. are used. At first special care must be taken not to give too vigorous a treatment or the patient may faint. Oral temperature should be taken before and after treatment. There should be an increase of ·5 to 1·5°. When the patient retains the increase in temperature until next day, treatments may be given on alternate days.

DIATHERMY IN ANGINA PECTORIS.

Diathermy through the heart is most efficacious for the relief of arterial spasm. A large indifferent electrode is placed under the back behind the heart. A smaller electrode is placed on the chest over the cardiac area. A mild current 300—800 mill-amp. is passed. In a few minutes all oppression, all pain, all feeling of anguish ceases.

DIATHERMY IN MYOCARDITIS.

Local Diathermy is used through the heart on alternate days. Cases with weak heart muscle, skipping pulse, exhaustion after slight exertion, are in a few weeks of Diathermy treatment made strong with normal muscle tone to the heart, and have a full even pulse. The electrodes should be placed as in Angina Pectoris and current of 300—800 mill-amp. passed for 20 minutes.

LOCAL DIATHERMY IN CIRCULATORY DISTURBANCES OF THE BRAIN.

In some forms of headache, especially when due to syphilitic lesions, in conditions occurring in people beyond middle life variously described as cerebral endarteritis, nervous breakdown, cerebral Neuresthenia, and also in certain cases of epilepsy, only small electrodes are used. Moist Kaolin pads are used between the skin and the electrodes. The electrodes are held in place by compresses and a folded triangular bandage. A current of 200—300 mill-amp. for 20 minutes is sufficient. This is useful in the treatment of early paresis. Argyel-Robertson pupil disappears. The treatment is supplemented by galvanism.

LOCAL DIATHERMY IN THE TREATMENT OF INTERNAL HÆMORRHOIDS.

The pain is relieved. A large indifferent electrode is placed on the hip, the sacral region or the abdomen. A rectal electrode warmed and lubricated is inserted with gentle pressure while the patient bears down-

ward. The uninsul portion of the electrode should be passed well beyond the sphinctres. A current of 800—1000 milli-amp. is permitted to flow for 10 minutes daily. The electrode should be allowed to cool before being withdrawn. The same treatment may be used for an inflamed or enlarged prostate.

DIATHERMY IN DISEASES OF NERVOUS SYSTEM.

(1) *Local Diathermy in Ataxia.*—In cases of shuffling, uncertain gait cases with a pronounced Rhomberg and the loss of planter sensation, Diathermy is an efficient remedy. A long narrow electrode 3½ by 8.10 in, is placed over the dorsal and lumbar spine and a large indifferent electrode is placed under the abdomen. A current of 1000—2500 mill-amps. is then allowed to pass for a period of six weeks to six months. The treatment should be supplemented by galvanism.

LOCAL DIATHERMY IN INFANTILE PARALYSIS.

One thing in these cases is perseverance. The treatment should be given daily for months. Between the treatments the limb must be kept warm by suitable clothing. Diathermy should be applied "directly and primarily over the site of the spinal lesion and incidently throughout the entire paralysed region."

DIATHERMY IN NEURITIS AND NEURALGIA.

It is easy to understand why Diathermy should give such wonderful results in neuritis. Circulation is increased and stasis in the region of the nerve disappears and with it the pain caused by it. A temporary increase in pain is often noted when treating a nerve or a joint with fibrosis. This temporary increase is a welcome symptom as it warrants a favourable prognosis. In cases of sciatica accompanying lumbago, large electrodes should be used, one over the lumbar and sacral regions and one under the abdomen. A current of 800—2000 mill-amps. is passed for a period of 30—40 minutes. In cases where great pain is experienced along the course of sciatic nerve, this treatment may be supplemented by placing a large indifferent electrode over the lumbar sacral region and a roller or condenser electrode applied with firm pressure along the course of the nerve.

Trigeminal Neuralgia.—An active electrode about the size of a Rupee is placed just in front of the ear on the affected side. The face lies on a large indifferent electrode. A current of 200-400 mill-amps. is passed. Treatment is repeated daily. Another method for the physician is to throw himself into the circuit by holding the active electrode in one hand and applying fingers of other hand to the affected area.

(1) Encysted hydrocele of the cord :—A rounded tense swelling; when you hold the testis it is fixed; up and down movements of the swelling in the canal.

(2) Diffused hydrocele of the cord :—Practically a cellulitis of the cellular tissue of the cord; a sort of œdema, no translucent swelling, no free movements in the canal, no elasticity.

(3) Hernia.—Ordinary normal hernia, impulse on coughing, can be reduced back into the abdomen; rounded or nodular in outline, feel is soft—a reducible swelling.

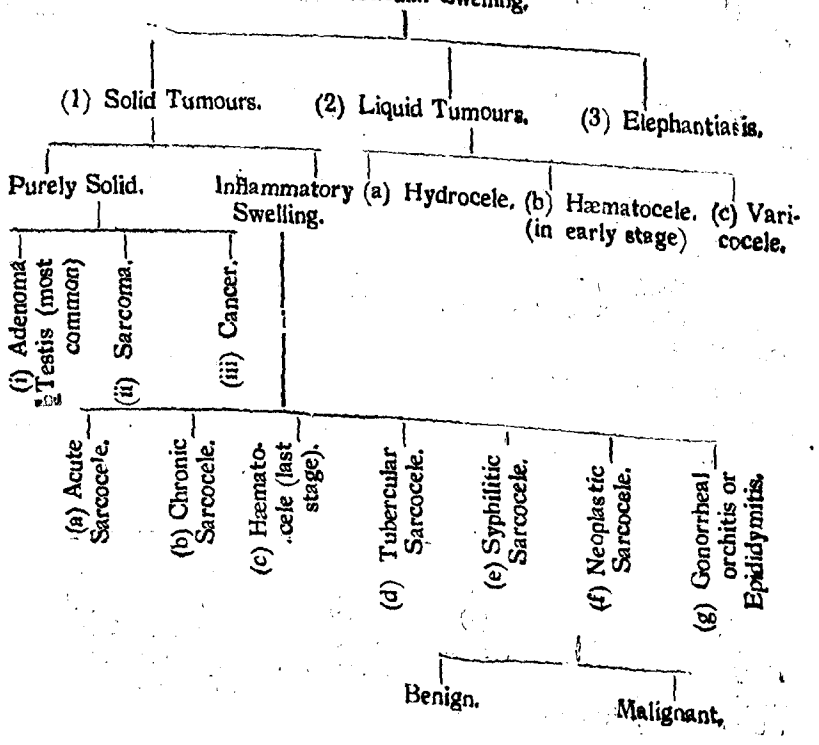
(4) Hæm atocele of the cord.—History of injury is most important, more uniform inconsistency and more rounded in outline than Omental hernia which can be mistaken for it; certain amount of fluctuation present; irreducible and without an impulse.

(5) Congenital Hydrocele of the cord.—The general signs of a vaginal hydrocele; the fluid can be sent back into the abdomen by pressure; dullness, rarely seen in others than infants. Is generally elastic, fluctuation obvious etc.

(6) Chronic abscess.—In connection with appendicitis, tubercular diseases of the spine and hip-joint disease.

If the swelling originated in the scrotum itself it can possibly be:—

B.—Testicular Swelling.



(1) (*i*) *Adenoma Testis*:—Generally seen in adults possibly due to injury; testicle of a large size and weight, rounded and elastic, no pain etc., cord is unaffected.

(*ii*) *Sarcoma* :—Commences in the body of organ, a rounded swelling at first irregularly smooth but later on nodular. Cord and scrotal tissues affected in the later stages, then ulceration and formation of fungus testis. Inguinal glands involved, a feeling of weight and dragging, testicular sensation absent; pain and cachexia on involvement of the cord.

(*iii*) *Cancer*:—Very rare, a soft rapidly growing tumour, an early enlargement of cord and inguinal glands, ulceration and fungating mass, secondary deposits in the abdominal and inguinal glands. Very difficult to diagnose from sarcoma.

(*1*) (*a*) *Acute Sarcocele*:—Testicle enlarged, pain and tenderness, temperature, vomiting and constipation present.

(*b*) *Chronic Sarcocele*:—Result of acute sarcocele, a previous history of acute orchitis, no pain or tenderness, an enlarged and a hard testicle.

(*c*) *Haematocele* (last stage) :—History of injury, a fluid centre, no translucency, at first fluctuating but later on a hard mass.

(*d*) *Tubercular Sarcocele* :—Unilateral, generally accompanied with suppuration in the Epididymis; early affects the cord: never accompanies the hydrocele, bead-like appearance, small nodules studded in the testicle.

(*e*) *Syphilitic Sarcocele* :—Chiefly affects the body of the testicle; mostly accompanied with hydrocele, early loss of testicular sensation, a bilateral condition; never accompanied with suppuration.

(*f*) *Neoplastic Sarcocele* :—Weight.

Benign.	*Malignant.*
(1) In adults.	(1) In old; also children.
(2) Glands not enlarged.	(2) Glands enlarged.
(3) Cord is free.	(3) Cord involved, hard etc.
(4) No suppuration or ulceration except in skin.	(4) Suppuration, etc.

(*g*) *Gonorrhoeal Orchitis or Epididymitis* :—Result of gonorrhoea, a very painful condition, discharge from urethra, acute and sub-acute stage.

(2) (*a*) *Hydrocele* :—A local swelling in the scrotum, a pyriform, elastic, tense, translucent, painless and a fluctuating swelling, testicle situated on back.

(*b*) *Haematocele* (*in early stage*) :—History of injury, swelling soon after injury, local marks of injury *e.g.*, contusion, bruise etc.

(*c*) *Varicocele* :—Peculiar feel, worm like swelling disappears when the patient is in recumbent position, and appears on standing. If circulation is

stopped at the ring by pressure, lower portion is enlarged by blood accumulation.

(3) *Elephantiasis*:—A purely scrotal swelling in connection with the skin. Thickness of skin always accompanies hydrocele.

TUBERCULOSIS AND ALLIUM SATIVUM

By

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Standardisation of a preparation from Allium Sativum and Cepa.—The readers of the "Antiseptic" are perhaps familiar with the paper in the May 1922 issue of this journal, pages 228-230, in which the medicinal use and the pharmacological action of *Allium Sativum* (garlic) were discussed. The writer has since carried on investigations to standardise a method of extracting the active principle of *Allium Sativum* in conjunction with that of Allium Cepa. The active principle of *Sativum* is a dark brownish-yellow volatile oil while *Cepa* contains mostly *glucosides* as its active constituents and in this respect it is more akin to *Urginea Scilla* than to *Sativum*. The form in which the volatile oil and the glucosidal content of *Allium* has been extracted at the laboratory of the Calcutta School of Chemical Technology is suitable for administration either by mouth or by injection. The first alternative of oral administration requires an *ordinary* dose of 5 to 15 minims and has practically no drawback unless the slight alliaceous odour inherent in these few drops is taken exception to by people of peculiar idiosyncrasies. The second alternative of injections may be proceeded with very cautiously with a dose of 0·1 to 0·3 cc. to begin with. The preparation referred to is perfectly miscible with water and may be conveniently handled if administration by injection is generally preferred by the medical profession and the patients alike.

Name of the preparation.—It has been issued under the name of Tincture Garlic (S. C. T.), but in future it will be known as Allyl Co. (S. C. T.), the latter designation appearing to be more appropriate to and indicative of the character of the preparation.

Dosage.—The ordinary adult dose, as mentioned, is 5 to 15 minims diluted with a little water, milk, syrup, honey or fruit juice and taken twice daily either after or before meals. The dose may be safely raised to 30 minims and repeated every 3 or 4 hours until acute symptoms are relieved.

Treatment.—Allium Sativum *cum* Cepa has already been tried in the treatment of Tuberculosis and other infective diseases and the following is a summary of a few interesting cases:—

(1) *Tuberculosis* (reported by Dr. S. K. Chatterjee, B. Sc., M. B., of Messrs. Banks & Co., Calcutta). A young man, Hindu, aged 21, with T. B. history in the family and parent died of T. B., was having hacking cough; sometimes spat blood; fever 99°; very little clinical sign in the lungs. After a two months treatment with ten drops twice daily there was no fever, less cough and the patient much improved in health.

(2). *Asthma*, 15 years standing (reported by (*a*) Mr. T. D. Pal, aged 64, 45 years experience in the medical line, residing at 3, Fakir Chand De Lane, Calcutta, and (*b*) by Mr. M. D. Isaac, Cashier, Tataparai Camp, Tinnevelly). Much relief experienced.

(3). *Influenza, whooping-cough, chronic bronchitis and gastric disorders* (reported by Dr. S. N. Sardar, L. M. S., late Chief Medical Officer. Kalahandi Feudatory State). Excellent results.

Extended Trial.—(1) The preparation is understood to be still under trial at the Central Jail, Salem, S. India. Dr. A. Apparameswaram, L. M. P., reports that the result is still non-encouraging. Fresh supply of preparation taken and further reports awaited. (2) Dr. V. N. Ramaswami Iyengar, private Medical Practitioner, Woriur, Trichinopoly, reports that he has obtained good results in the two cases tried, namely, one for asthma and the other for fetid bronchitis. On the 29th November last he wired for two pounds and no doubt the result is promising. (3) The School of Chemical Technology, Calcutta, has sent supplies to various parts of India in compliance with requisitions and if results, whatever they may be, are kindly communicated, it may serve the interests of science and of humanity as well.

Need for further research.—From the reports received up to date and from the results experienced in the family of the writer and of his relations it is presumed that Allyl Co. affords a valuable intestinal antiseptic and bactericide to combat several bacillary diseases. It now rests with the medical profession to give the preparation, which is really a food article, an extended trial and to note the clinical and metabolic changes that are produced, also to observe its physiological and bacteriological action. The School of Chemical Technology, Calcutta, feels very much handicapped in carrying out its humble work in the domain of medical research, there being no hospital attached to the School. It, therefore, most earnestly invites the co-operation of all interested in the work and begs to thank them for the assistance they have already rendered.

PREVENTION OF SHOCK AFTER SURGICAL OPERATIONS

By

AMARNATH YAJNIKA, M.C.P.S.

Prolonged starvation and severe purgation before operations should be avoided especially in children and in aged. If circumstances render it practicable, the physical tone of the patient must be raised as much as possible before operation.

The preparation for the operation must be conducted away from the sight and hearing of the patient, so as to minimize the amount of mental excitement. For the same reason it is desirable to give the patient hypodermic morphia the night before the operation and to repeat the same in the morning. All the severe operations should be performed with the head low as in the Tredelburge position, because this helps to maintain the circulation in the brain and therefore reduces the risk of shock.

The body warmth of the patient must be carefully attended to during the operation and the entire technique must be conducted so as to avoid tearing or dragging or bruising of the tissue. Gentleness of touch, rapidity of execution, and general dexterity reduce the risk of shock very considerably. If it appears likely that the shock will follow the operation a subcutaneous infusion of saline before its completion will probably prevent its occurrence.

The danger of shock is practically abolished in spinal anæsthesia conducted on the principle of anoci-association as enunciated by Crile. The method cuts off the area of operation from the general nervous system by means of infiltrating the skin with 1-1400 sol. of Novocaine, and if an abdominal operation is being performed, the parietal peritoneal edges are injected with 1-20 sol. of urea and quinine hydrochloride.

The patient is spared a great deal of mental anxiety attending the operation by the preliminary injection of morphia 1/6 gr. with hyoscin 1/100 gr. which has the effect of removing the element of fear, and also of reducing the amount of chloroform or ether required to secure anæsthesia.

THERAPEUTIC NOTES ON HORMOTONE

By

J. C. BAGCHI, L.M.P.

I have written something about "Hormotone," made by G. W. Carnrick, U. S. A. in the "Antiseptic," in the month of October 1924. To-day I have something more to write about this organic medicine by

which I have been successful to remove the name of "mullipara", of a woman who was placed under my treatment in June 1924. This woman was married about 14 years ago. She menstruated regularly for the first two years without any complaints. After this period she felt some trouble during the menstruation. Her constitution was good. Every one was eagerly waiting to see her a mother of a child so long. At last members of her family found that her impregnation would be impossible. When she was under me for treatment I only advised her to take "Hormotone," without post pituitary, one pill to be taken twice daily during each menstrual period. I am astonished to see that her conception has taken place in August 1924 and this is the fifth month of her pregnancy.

I request my brethern to write about this, in the "Antiseptic."

COMMON SALT AS A REMEDY IN MALARIAL FEVER

By

SATI BHUSAN MITRA, B.Sc., M.B.

I learnt from the contents of an article written by Dr. Brooke, in an American Medical Journal, that ordinary (common) salt is an efficacious remedy in malarial fever. I did not like to circulate the matter to my professional brothers till I was fully convinced of its efficacy in the said malady. Now, I venture to scribble something about the above for publication in your well-esteemed and widely circulated paper as I have seen the marvellous effect of common salt in the treatment of few malarial patients.

Dr. Brooke says that the common salt is an efficacious remedy in malarial fever. He further adds that one dose or even two doses of this cheap and easily obtainable common salt is only required to check an attack of any kind of malarial fever.

Mode of administration.—A good handful of clean sodium chloride is first thrown on a well-washed frying pan which is being kept warm by the application of heat from underneath to drive off fully the water of crystallisation contained in the common salt. Such an application of heat is continued until the said salt took the brownish tint.

Dosage.—For adults—one tablespoonful of this roasted salt which is equivalent to one ounce.

This amount of the salt after being well mixed with one glass of hot water should be taken in an empty stomach in the morning of the day before the date of an attack of fever. In quotidian type of malarial fever, after its remission or its cold stage being removed, it should be taken in an empty stomach. Not more than one ounce should be administered per

mouth. But the dose should not be less than one ounce. It would be of no effect if the medicine is not taken in an empty stomach. Consequently, the patient should not be given any food or even water before the medicine is administered.

Although the patient becomes very thirsty immediately after the medicine is taken, still he should not be given any other food except water. This water should be slightly warmed and should be drunk at a time in a drachm quantity off and on. If the patient becomes very hungry he should not be given any other food except light diet, *e.g.* chicken broth after forty eight hours. Within twenty four hours after taking the salt water he should drink only little water off and on, otherwise he would derive no benefit at all.

Regarding diet, he should be very careful. Further he should remain careful as to cold exposure within forty eight hours after the administration of medicine. He should be instructed in such a way that he should wear always warm coat and stockings. Dr. Brooke in his 18 years' experience in the medical practice did not get baffled in his object of curing patients after following the above principles. He was able to cure each patient by using this roasted salt after 48 hours. None had the relapse of fever. This medicine was rarely used twice in a patient. In Hungary, hundreds of patients are cured by adopting the above procedure. In hot countries of America nearly four hundred Englishmen are attacked with malarial fever each year.

Treatment of Epilepsy and Migraine by Luminal.—In epilepsy, luminal in the form of sodium luminal (soluble salt) is being highly used now-a-days. Dr. F. Golla has successfully treated many epileptic patients with this medicine after his failure with Bromides. I have also found it to be very efficacious in the treatment of epileptic fits. In cases where the fits occur in rapid succession it is highly useful and in cases where the fits occur at longer intervals it is of little use. Moreover, I have found wonderful effect in using sodium luminal in cases where Bromides did not produce the wished for result. Epileptic patients can very well bear this drug without any evil effects. Patients can take this medicine in a dose of 1 to 2 grains. In a dose of ½ to 1 grain twice daily (one dose at night and another in the morning) or in some cases 1 to 2 grain dose once at night, it can be administered internally.

In migraine cases, I have also found it to be equally useful. Dr. Harris says that the medicine in smaller dose can produce the desired effect in migraine. Sodium luminal in a dose of ¾ gr. is useful thrice daily. If this dose produces the wished for result, I think it is absolutely unnecessary to increase the dose. One week after, we can use the medicine twice instead of thrice daily. Sometimes, I have seen the appearance of urticarial rashes on the body of patients after the use of this medicine in the above mentioned dose. Of course, it is due to the use of excessive dose or its long continued use. Consequently, it should be used in a dose of ½ to ¾ grains thrice daily, for one week and then twice daily.

A CASE OF FAECAL SCYBALÆ AS A COMPLICATION OF DYSENTERY

By

U. VEKATA RAO, L.M.P., MEDICAL PRACTITIONER, "SUDARSANA," MADRAS.

On November 15, Miss Jagamani, aged 9 years, came for treatment. She was being treated for Dysentery for about a month both by domestic and bospital medicines. She was having four or five motions a day with slime and blood accompanied by severe tenesmus and pain-she had two emetin injections and some 30 powders of Bismuth and Dover's. I examined her anus and rectum and found nothing. I gave her 2 ounces of mist. Oli Ricini. ½th part every four hours. Next day the condition remained the same. I gave 3 ounces of mist. Oli Ricini ½th part every four hours. She had four motions with some four or five hard round foecal lumps of a large marble size attended with much pain and blood. As she detested castor oil I had to give her next morning ½ an ounce of liquid paraffin and repeated it again in the evening. She had three motions with about a dozen foecal black lumps but with less blood and pain. The fourth morning she was given ½ a teaspoonful Pul. Glycerrhiza Co. in milk. She had no motions. The powder was repeated again at 6 P. M. At midnight she complained of much pain and was very restless. After an hour she had a very large motion with about ten hard lumps of marble size and a little blood. The pain stopped. Next morning she had a semi-solid motion with no blood. Since then she is alright and she is continuing taking half a teaspoonful of Pul. Glycerrhiza Co. at bed time in milk.

The formation of hard faecal scybalae of a large glass marble size, each distinct by itself and surrounded by a little slime is probably due to Post-Dysenteric constipation and the subsequent slimy, blood-stained, painful four or five motions a day are due to the irritation of these hard scybalae.

DEATH OF A CHILD CAUSED BY ACCIDENTAL SUFFOCATION

By

D. BHARADWAJA, L.R.C.P. & S. (EDIN.), GANGOH.

About a month ago, a child (about 2 years old) was brought to my dispensary for treatment. There was some blood about the mouth and nose, and the child had difficulty in breathing. On enquiry

I was told, that the child was playing with a tin *Jhuri Jhuna* with the broad end of it in his mouth and while crawling over the threshold of a door his head fell and the broad end was thrust into his throat. They apparently tried to pull it out, but failed, the handle was either broken during the fall or by the people who tried to pull it out. I tried with my fingers to pull out the foreign body, but failed. It seemed so easy, yet so difficult. I tried to snare it with a piece of thread but failed. My forefingers were badly bitten and bagan to give me pain. I wanted to perform tracheotomy, but was not allowed. I sent for another practitioner, who also tried to remove the foreign body manually but failed. The child died of suffocation. As such like accidents are liable to occur to children, I should like to have the opinion of some gentleman, who might have some experience. This was my first case of this nature and it reminded me of the difficulty we generally experience in getting out a cork which has been pushed down a bottle. All I could think about was to open the trachea, so as to let the child breathe freely, and then to push up the foreign body from the back of the throat.

I was told afterwards, that the relatives did not like to bury the corpse of the child with foreign body in his throat and tried to remove it, but failed. I myself had the idea of asking their permission, but thought they would not like it.

The Antiseptic

JANUARY, 1925.

MAJOR-GENERAL GIFFARD ON THE FUTURE OF MEDICINE IN INDIA.

The opening of the School of Indian Medicine in Madras recently, has created quite a flutter in the dovecotes of the British medical men and exasperated their feelings to a degree which transcends all description.

We have already noticed that Lt. Col. Elliot, a retired I.M.S. Officer from Madras, was the first to start the game and set the ball of vituperation in motion, and now Sir Gerald Giffard has followed suit. Heaven knows how many more are awaiting their turn and what amount of calumny is in store for the Indian politicians and the medical profession in India generally and those in Madras in particular.

Under the auspices of the East Indian Association, Sir Gerald Giffard delivered a lecture on "Some aspects of the future of medicine in India". Therein he raised four issues and tried to answer them in the light of his own knowledge and experience. His first question was "should India continue and expand the present system or should the British system be gradually substituted?" In Great Britain, though there is a Minister of Health with a small professional staff under him, the Hospitals are voluntary subscription hospitals, the Medical Colleges and Schools are private institutions, and the medical profession is composed of private medical practitioners. Things are, no doubt, different in India and the entire Medical Department is conducted by the Government and Sir Gerald wants to know how long is this system to continue? If we go back and trace the history of the genesis of the Government Medical

standard of excellence prevailing in their mother country. But who prevented them from performing this primary duty is what we cannot conjecture, and, perhaps, the answer must be searched for only in Sir Gerald's heart.

The third and most important question was, "what system of medicine should prevail in India—the Allopathic or the Western system or the indigenous systems—the Ayurvedic and Unani?" This is what Sir Gerald said:—"In Great Britain the medical profession taught and practised one system of medicine which, in India, found itself in competition with the old unprogressive, decadent Ayurvedic and Unani systems. Thirty years ago, it seemed probable that these so-called systems of medicine (both of which are in reality vestigial remnants of the knowledge available to the world from 1000 to 2000 years ago) would rapidly die out with the spread of the knowledge of medicine from Europe. This, however, had not proved to be the case. A large school of Ayurvedic Medicine had been founded at Delhi and several of the provinces also now had small schools."

"We (Western) medical men and women" continued Sir Gerald, "have seen with disapproval, disappointment and even with disgust that the Viceroy and some of the Provincial Governors have lent their personal support to these institutions. Indian politicians almost unanimously support them. Local Governments since the Reforms have, in several instances, voted money for Ayurvedic and Unani institutions and have subsidised their practitioners".

We do not agree with such wholesale condemnation of the Ayurvedic and Unani systems of medicine though we are prepared to admit that the systems, being in a state of long stagnation, are unworthy of adoption in toto at the present day without considerable re-moulding and re-casting in the light of modern scientific researches and experiences. The late Surgeon-General Sir Pardey Lukis while speaking of the Ayurvedic system of medicine said: "The longer I remain in India and the more I see the country and the peoples, the more convinced I am that many of the empirical methods of treatment adopted by the Vaids and Hakeems are of the greatest value and there is no doubt whatever that their ancestors knew years ago many things, which are now-a-days being brought forward as new discoveries." Look at this picture and on that. The theory that Greece was "the Home" and Hippocrates "the

Father" of medicine was blown up by more than one Western medical savant and a few quotations from Oriental Research scholars to establish the superiority and scientific nature of the Ayurvedic system of medicine will not therefore be out of place here:—

1. "It is to the Hindus," says Wise, "we owe the first system of medicine."

2. Royle has proved beyond doubt "the indebtedness of the Greeks and Arabs to the Hindus."

3. Neuberger in his History of Medicine says: "In consideration of the outstanding independent achievement of the Indians in most branches of Science and Art, and of their aversion to foreign influences, the trend of opinion to-day, inferred by recent discoveries, is in favour of the *originality of the Indian Medicine* in its most salient features."

In the field of surgery, the ancient Hindus were no less prominent. Here are a few extracts from European sources:—

"The Hindus diagnosed fractures, besides other signs from crepitus,.....They had defined and differentiated between different wounds, forms of contused wounds, etc. Face and scalp wounds were being sutured by them. The Hindus had invented very ingenious methods for the extraction of foreign bodies and under special circumstances they used the magnet for the extraction of iron particles.....Splints of various sorts were used for fractures." *Wise* praises the use of splints in the following terms:—

"I have found this wonderfully improved splint so useful and effective in different forms of fractures, especially for the fracture of humerous, wrist and the bones of the forearms."

Preventive Medicine was not unknown to the Ancient Hindus. They were fully alive to the truth of the maxim "Prevention is better than cure." Their whole literature teems with elaborate and minute instructions on Personal Hygiene and Public Health. They even resorted to vaccination to prevent small-pox. They have long ago discovered many things which baffle modern bacteriology.

With such high credentials about them, these two indigenous systems of medicine ought not to be considered as "dead past" and consigned to the realm of absolute forgetfulness but, in our opinion,

Department in India, we will find that it first originated from a purely political motive. In the days of the John Company when there were frequent internecine wars and there was constant struggle for supremacy in the East, a number of medical men were found necessary for military purposes. The I. M. S. thus came into existence, but even after the wars were over and quiet was restored in the land, this contingent of medical men had to be retained to meet emergencies. To provide them with work during times of peace, the I.M.S. men were thrust on the Civil Department temporarily and on the distinct understanding that they should desert the Civil and revert to the Military in the event of a war. To fill up the gap and also to assist the I.M.S. men, the Government on the Civil side had to educate and train a number of Indians on the Allopathic system and these were christened "the Dressers". Subsequently, with the rapid growth and expansion of territory and with the dawn of an organized Civil Government, the need for more medical men was keenly felt, and the Government was obliged to open Colleges in important centres and turn out more medical men of varying professional capacity and attainments. But even after 150 years of established British Rule in India, the number of medical men manufactured in Government Medical Schools and Colleges is miserably low and does not go to serve even 1/10th of the civil population in India. The Government must make amends for their failure to provide sufficient medical relief to the people in the past and their responsibility therefore cannot cease all at once. Moreover, private philanthropy and private enterprise, though not wanting in India, are, for the time being, dead for want of official support and sympathy. A few years ago, a National College of Medicine was started in Calcutta and supported by voluntary contributions and private munificence. It was manned by experts trained in the Allopathic system but the products of this College were not recognized, though they owned diplomas corresponding to the L.R.C.P. and M.R.C.S. of England. Their qualifications were not registerable even in India. So the institution died a natural death. We ask, what would the fate of private medical men in England be, if the Government declare that their qualifications will not be recognized, that their certificates are not valid and that they would be treated as no better than quacks, even if they possess eminent qualifications? Unless the Government allow a free hand to the people in the matter,

based on mutual trust and confidence, there is no prospect of the British system being followed in India and the Government must continue to discharge their duty and responsibility to the public, with regard to medical relief, for a considerably long time to come, unaided by private purse.

The second question Sir Gerald had raised was "should the Government Medical Colleges and Schools in India continue to turn out imperfectly trained medical practitioners or must there be one standard, one minimum qualification in India?" Sir Gerald deplores the lack of sufficient training and knowledge on the part of the medical men trained in the several Colleges and Schools in India, which particularly places them at a disadvantage in that their qualifications are not registerable in England, and suggests, perhaps rightly suggests, a standard of minimum qualification in India. Now let us examine and find out on whom the responsibility for this deplorable state of affairs ultimately rests? Was not Sir Gerald himself, at one time, head of the medical institutions in Madras, an accomplice, if not the actual offender in this respect? The adaptability of the Indian brain to varied fields of knowledge, his quick assimilation and grasp of foreign tongues, his versatile genius and dogged perseverance are matters of repute and even beyond all dispute. But, with all these characteristics and his traditional love of knowledge, if the Indian is still in the background, it is because two essential links are wanting, *viz.*, money and opportunity. Education is rather a costly affair in India now-a-days and medical education is more so. For want of means only a few attempt the study of the healing art while the deserving many rest content with a bread-winning knowledge of English which befits them only for the posts of quill-drivers under Government or to serve as traders' clerks. The curricula of study were and are still being drawn up by Western medical potentates of the type of Sir Gerald and if any blame attaches itself to the medical profession in India for their imperfect knowledge and their inferior quality it must first be laid at the doors of Sir Gerald and officers like him, under whose direction the Medical Department was run all along.

Again lack of opportunity was another serious handicap to progress in medical science. All the important clinics in India are under the direct control and supervision of the I. M. S. Officers and it was quite open to them to bring the medical students in India to the

must be revived, resuscitated and placed in the forefront among the medical systems of the world.

The last point raised by Sir Gerald was "should the State in India solely support and press forward (Western) medicine or should its money be spent partly in Western medicine and partly in Ayurvedic and Unani Institutes and services ?"

Our answer must be that there should be a happy coalition of the two systems to suit the Indian people, their habits and mode of life, their constitution, their temperament and their environments. The Government must, therefore, evolve and build up a separate system of medicine for India and to this end strive to allot more funds annually for research work, etc. We, Indian medicos, trained in the Allopathic school, have also to shoulder some responsibility in making this experiment a success. We must not remain here mere imitators of our European masters as we have been trained to be. Let us with gratitude take all that is good in them. The English language has happily welded together the two great nations of the world—the Indians with their hoary excellent past and the Englishmen, the pioneers in modern civilization, arts, and science. Let us take advantage of this language and build up the future of medicine in India which must be a cheap, ever-lasting, and permanent system and not of a costly ephemeral type as the Allopathic system is at the present day.

THE INDIGENOUS SYSTEMS OF MEDICINE.

We are sorry that our editorial in the December issue of the "Antiseptic" should have caused annoyance to some of our readers. We never meant any disrespect to Lt. Col. Elliot, I.M.S., nor employed any reproachful terms towards him as stated by our esteemed critic in his letter published elsewhere. We, on the other hand, only tried to repudiate the baseless charges levelled against Indian politicians in respect of their policy and leanings towards the indigenous systems of medicine and to exhort the Indian medicos to stand firm and united in accomplishing the laudable object of founding a suitable and solid system of medicine for India, the want of which is sadly felt at the present day by all shades of competent public opinion and thought in India.

Our critic thinks that the statements made by us are such as to make it probable that "the pot is calling the kettle black." In our opinion neither the Allopathic system is 'kettle' nor the Ayurvedic or Unani system, 'pot.' Neither has soot or blackness about it; on the other hand, each has its effulgence of glory. Only what is efficacious and excellent for one physical condition cannot be the same for another—this was our enunciation and the emphatic finding of some of the greatest authorities, European and Indian, on the question of the right sort of medicine for India. It is this point that our critic misses.

With regard to our enquiry as to 'whether any of the modern scientists of the West ever attempted to unearth the medical lore of the Hindus and Muhamadans and prove to our satisfaction that they are what they are termed to be unscientific and empirical', we are aware that some research work has been done by a few European and American scholars but the findings and conclusions of the more advanced and impartial of them only go to prove the scientific nature of these two systems. Our contention is that the contrary—*i.e.*, that the systems are unscientific and empirical—has not been sufficiently proved to the medical world. This is another point of ours which our critic misses. Max Nuberger, in his History of Medicine, observes: "The medicine of the Indians, if it does not equal the best achievements of their race, at least nearly approaches them; and owing to its wealth of knowledge, depth of speculation and systematic construction takes an outstanding position in the history of oriental medicines". Hœrule in his Osteology says, regarding Hindu medical science, "Its extent and accuracy are surprising when we allow for their early age probably the sixth century before Christ and their peculiar methods of description." "The Hindus were acquainted with the circulation of blood and the distinction between the artery and the vein, the use of anæsthetic, the means of averting hæmorrhage and the proper treatment of surgical wounds." How can a system which contains such scientific truths as above be termed empirical ?

Lastly, in respect of the Unani system, the mere fact that Unani means 'Greek' is no sufficient argument to concede that the system is more occidental than oriental. On the other hand, there is as much evidence to show that the Greeks and Arabs borrowed their systems from the Hindus. According to this school of thought, the Greek Medicine of which Hippocrates was the father came back to Western Asia there to be perfected by Avicenna, the founder of the

Unani system and taken to Southern Europe during the Mussalman conquest. Thus the modern medical system which is based on the Greek system owes its origin to the Unani system which in turn is traced, by this school, to India. It is, therefore, a matter of controversy and that our critic should assume by the supposed etimological significanc of Unani that the system is more occidental than oriental is to give to his statement the veracity of an historic fact.

CORRESPONDENCE.

To, THE EDITOR, "*The Antiseptic*," MADRAS.

SIR,

May I be permitted to address you in respect to your editorial in the current number of "The Antiseptic"? Whatever opinion Colonel Elliot may have expressed in the British Medical Journal as to the value or otherwise of the Ayurvedic and Unani systems of medicine, the terms of reproach employed by you towards Colonel Elliot are such as to make it probable that the pot is calling the kettle black. You enquire in a rather indignant manner whether "any one of the modern scientists of the West ever attempted to unearth the medical lore of the Hindus and Muhammadans and prove to our satisfaction that they are what they are termed to be unscientific and empirical." As a matter of fact, an immense amount of research work has been done both by Europeans and Americans on Medical Science in ancient times. I may refer you to Garrison's Introduction to the History of Medicine, to Withington's Medical History, to Leon Meunier's Histoire de Medicine and to Max Neuberger's, Geschichte der Medizin. Whether or not these authors have proved to your satisfaction that the medical lore of the Hindus and Muhammadans are both "unscientific and empirical", must be left to you to judge. At any rate the monumental work of Susruta and Charaka's revision of the treatise of Agnivesa certainly leave an impartial reader with the impression that in respect to the progress of medicine and surgery in India, a large debt of gratitude continues to stand to the credit of European scientists. In conclusion, I may be permitted to remind you that the term "Unani" means Greek, hence to be strictly accurate, the system of medicine associated with that name should be classed as occidental rather than as oriental.

I am, Sir, etc.,
OWIN BERKELEY HILL,
Major, I.M.S.

BOOK REVIEWS.

STUDENTS' GUIDE TO OPERATIVE SURGERY.

By A. T. Bazin, D. S. O., M. D. Assisted by F. A. C. Scrimger, F. J. Tees, L. H. McKim, I. Mch. Thompson. 126 pages, 1924 [Renouf Publishing Company. Montreal.]

This little book is only a guide to the study of operative surgery. It gives in a simple manner the steps to be taken in the various operations performed in ordinary hospital work. The indications for each operation as well as the instruments required for each are mentioned at the commencement of each chapter. The only drawback is that no mention is made of the procedure to be adopted in the surgical diseases of the Rectum and the Anus. The technique of tying the common arteries in the body as well of performing easily the common amputations are clearly described. It ought to be of special interest to the teacher in that the book contains a chapter on the organisation of the class and a schedule of the operations. U. K.R.

LECTURES ON GONORRHŒA IN WOMEN AND CHILDREN.

By Johnston Abraham, C. B. E., D. S. O., M.A., M.D., F. R. C. S. With nine illustrations, 142 pages. Price 7/6 net. William Heinemann (Medical Books) Ltd. 1924.

The book consists of a series of 9 lectures delivered by the author and published to interest the general practitioner in this much neglected subject. It is an admitted fact that 50 % of the sterility in women, 40 % of all gynaecological troubles and 20 % of total blindness are due to unsuccessful treatment of gonorrhœa. Still the fact is not realized by the public. The author deals with the subject practically and lucidly and the book must be read by every general practitioner. The chapter on 'Tests for cure in Gonorrhœa in Women' is worth perusing and very instructive. The illustrations are very good.

A MANUAL OF DISEASES OF THE EYE.

By Charles H. May, M. D. (New York) and Claud Worth, F.R.C.S. (Eng.) Fifth Edition published by Bailliere, Tindal & Cox, 8 Henrietta Street, Covent Garden, London, Demy Octavo. Pages vii + 460. 22 coloured plates, 337 Figs. Price 15 net.

A fifth edition of this excellent work on "The Diseases of the Eye" speaks well of the authors. The author's opinions and procedure have been in many ways original and have always commanded the attention and respect of all ophthalmologists. The subject is treated from every aspect of diseases and injury of the eye. Though no additions have been made to our knowledge of colour vision, many sections have been re-written and some new matter has been added. A new chapter on the uses of vaccines in ophthalmology has been added. Rare conditions and uncommon affections which are chiefly of interest to the specialist have been dismissed with a few lines and common diseases which the general practitioner is most frequently called upon to treat have been described with fullness. The authors have written this book covering all fundamental facts in ophthalmology, always keeping in mind that the book has been written for students and practitioners. The usefulness of this publication and the skill displayed by the authors in its compilation remain unchal-

lenged. We may go further and state that from the point of view of the opthalmologist the work deserves nothing but praise. The illustrations are profuse and very good and help the readers to understand the subject thoroughly. We commend the book to our readers.

DOSAGE TABLES FOR DEEP-THERAPY.

By Professor Friedrich Voltz. Edited by Reginald Morton, M. D. with 16 illustrations 98 pages. 10s. 6d. William Heinemnan (Medical Books) Ltd., London, 1922.

The explanations and tables compiled in the book are sure to be very useful to all those engaged in the practice of X ray therapeutics. Unless the technique is based on the use of a homogeneous radiation the results will not be successful. Radiologists must be very grateful to the author for this valuable contribution to this most difficult problem The failure of good results in X ray treatment is due to faulty technique and to the selection of unsuitable cases. Dosage tables are very instructive and useful. The practical examples illustrating the application of the tables distinctly simplify the dosage tables. We commend the book to all Radiologists.

U.R.

PRACTICAL CHEMICAL ANALYSIS OF BLOOD.

By Victor Caryl Myers, M.A., M.D., Prof. and Director of the Department of Bio-chemistry, New York Post-Graduate Medical School and Hospital. Second Revised Edition. Illustrated. Pages 232. Published by C. V. Mosby Company, St. Louis. Price 5 Dollars.

Of late much progress has been made in the direction of chemical analysis and study of blood. Determination and estimation of certain constituents of blood are very valuable data and are especially helpful in the diagnosis, prognosis and treatment of such constitutional diseases as diabetes mellitus, jaundice, nephritis etc. Dr. Caryl Myers' book presents a discussion of the clinical analysis of blood. which are of definite value in the diagnosis and treatment of diseases. Various methods for the determination, of the non-protein Nitrogen and its components urea etc., of sugar and lipoid constituents as well as mineral constituents and blood gases, and many others are well discussed with their respective techniques. It is really unfortunate that the author could not spare a few pages for the discussion of the latest views on the importance of the determination and estimation of the bile-pigments in the blood in jaundice. Many practical questions of diagnostic importance are discussed in the chapter on chemical blood analysis, their clinical use and interpretations. Another chapter deals with the quantitative micro-methods of urine analysis of interest in connection with blood analysis. The appendix gives a full account of the colorimeters and their use, a list of standard solutions and reagents, Tables of atomic weights and nitric equivalents and a fourplace Logarithm Table. The book will be of great use for both the general practitioner as well as the Laboratory Workers.

B.G. R.A.

MODERN METHODS OF TREATMENT.

By Logan Clendening, M.D., with chapters on special subjects, 692 pages, 77 illustrations. Price S. 9 00 Press of the C.V. Mosby Co. St., Louis, U. S. A. 1924.

The whole book is divided into, two parts. The first part deals with the general therapeutics and the methods used in treatment. The second part deals with the Special Therapeutics and the application of Therapeutics to particular diseases. In the first part one chapter is devoted to each of the following subjects *viz*., Drugs ; Biological Therapy and Prophylaxis ; Extracts of ductless glands ; Dietetics ; Heat and Cold—Hydrotherapy ; Medical Gymnastics and Massage; Exercises; Electro-Therapeutics; Radiotheraphy; Climate, aerotherapy Hiliotheraphy, mineral springs, Health resorts ; Psychotherapy, etc. In the second part one chapter is devoted to each of the following subjects *viz* :—The treatment of Infectious diseases, diseases due to allergy, diseases of metabolism, diseases of blood, diseases of the cardio-vascular and respiratory systems, diseases of the kidney and digestive systems and the treatment of the ductless glands. The book contains fund of information useful both to students and practitioners. The book contains much informa tion which could not otherwise be got by students unless they refer to a number of books dealing with these different special subjects.

BASAL METABOLISM.

By John T. King, J. E. Illustrated. 14 illustrations. Pages 118. Price S 2.5. Published by Williams and Wilkins Co., Baltimore.

Every one is familiar with the extensive research and the excellent summaries of the clinical applications of Basal Metabolism which are appearing in the Medical Journals and text books. To the physician, estimation of basal metabolism is of great importance in diagnosis, to establish the severity of the condition and to deduce the progress of the disease This volume gives a brief survey of the subject. The chapter on Physiology deals with gas exchange, heat production and dissipations ; Relation of heat production to the Thyroid and other endocrine glands ; Normal metabolism; direct and indirect methods of determination of basal metabolism, etc. The remaining chapters deal with the metabolism in Hyperthyroidism, in Hypothyroidism and in various other conditions, with their treatment. Details of the techniques of the several experiments and the use of the apparatuses are omitted, due to want of space. The illustrations are diagramatic and educative. We commend this book to our readers.

B G. R. A.

X RAYS: THEIR ORIGIN, DOSAGE AND PRACTICAL APPLICATION.

By W. E. Schall, B. Sc. Lond. F. Inst. P. 136 Pages. Price 5. John Wright & Sons Ltd , Stone Bridge, Bristol.

In this work the author has endeavoured to explain the Physical laws, the electrical and practical part, and especially the dosage is really of great help to beginners and medical students. The following are the contents of the book *viz*., the origin of X-rays and their properties ; the electrical apparatus; X-rays tubes and their treatment ; measuring the X-rays—Dosage. The practical application of X-rays for diagnostic purposes ; for therapeutic exposures and Tables, etc. The subject is very well dealt with. We commend the book to our readers.

GOLDEN RULES OF DENTAL MECHANICS.

By Harold Osborn, 107 Pages, 5-net, John Wright and Sons Ltd , Bristol.

The booklet gives in a convenient form some of the useful hints, notes, and data derived from the practical experience of the past twenty two years of the author. The information contained in the book is not complete but contains practical points useful to dentists. In this second edition under review, the notes have been revised and a few new items added.—*U.R.*

AIDS TO SURGERY.

By Dr. Joseph Cunning, M.B. B.S., and Dr. Cecil A. Joll, M B. (Lon.), F.R C.S. Fifth Edition, 434 pages, Price 4-6. Bailliere Tindall & Cox, 8. Henrietta St. Covent Garden, London.

This is a very useful book for students who go up for their final examination. The whole subject of surgery is compressed in a small space of 434 pages, giving all the important symptoms, diagnosis and treatment, etc. The subject matter has been brought up to date. We commend the book to students.

AID TO PSYCHIATRY.

By W. S. Dawson, M. A., M.D., 309 Pages, price 4-6 Publishers Bailliere Tindall & Cox, 8, Henrietta Street, Covent Garden, London.

In this useful book a description of the different forms of mental disorders are given in a concise form. The first part deals with psychology which has a special bearing on the disorders of the mind. The book is very useful not only to medical students, but also to those who are learning to deal with cases of mental disorders. As with other aids this is useful only for examination-going students to refresh their memory.

NOTES ON TOXICOLOGY.

By Dr. S. Mallannah, M.D, 34 pages. Price As. 4. Printed at the Golden Press, Hyderabad, Deccan.

This booklet is intended for students, to take the place of Notes and for references just before their examinations. It may be classed among aid series of Messrs. Tindall & Cox. We commend it to students.

THE ROCKFELLER FOUNDATION-ANNUAL REPORT FOR 1923.

Published by the Rockfeller Foundation, 61, Broadway, New York.

The report furnishes an interesting review of the work done by the Rockfeller Foundation during the year 1923.

Among the notable monetary contributions to the cause of medicine and Public Health made during the year by the Rockfeller Foundation may be mentioned (1) provision of Fellowship Funds for 636 individuals in 29 different countries, (2) aiding Japan by sending scientific materials to that country after the earthquake, (3) offering £ 280,750 to the development of medical education in certain Universities in the British Isles, (4) continuing or commencing the anti-hook worm work in conjunction with 20 Governments in various parts of the world, &c. The policy and aim of the Foundation cannot be more vividly expressed than in the following words of the President of the Foundation :—

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LUNACY IN INDIA.

By A. W. Overbeck Wright, M.D., M.B., C.H.B., M.R.C., D.P.H, Published by Bailliere, Tindall and Cox, 8 Henrietta Street, Covent Garden, London. 406 pages, price 21 net

This book has been written to summarise the condition of lunatics in India and the means available for treating them. The author has placed before the readers his views which a wide and varied experience of the East for over 19 years has given rise. Beginning with the medico-legal aspect of the problems the author lays stress upon the importance of toxæmias as ætiological-factors in the production of a very large number of cases and the usefulness of recognising such facts in the treatment of the same.

The author gives out various methods of preventing mental disorders, chief among them being the uprooting of the old superstitious ideas regarding

lunatics and asylums. It remains yet to be seen how far the proposed reforms towards the amelioration of the lunatics will be successful with the present system existing in the lunatic asylums. Unlike other text-books which are nothing but a catalogue of mental diseases, the author divides the subject from the standpoint of ætiological factors, insanities of toxic and non-toxic origin and in the final chapter gives a system of general treatment.

In the appendix he describes the mode of procedure for dealing with military insanes ; various forms as per Act IV of 1912 ; list of asylums in India, various questions that may be put to a medical witness in cases of suspected insanity. The medico-legal responsibility of the medical profession in this connection are heavy and especially in private practice the medical man is often met by most delicate questions. In all such cases a thorough knowledge of the subject by perusing this book will not launch the medical practitioner into a nasty fix as is often the case in subjects such as lunacy—a subject which is not well taught and less understood.

DRUG REVIEW.

'TABLOID' HYPODERMIC INSULIN HYDROCHLORIDE (STERILE.)

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ACKNOWLEDGMENTS.

"The Bloodless Phlebotomist"—In the November Issue of this Journal are some authenticated incidents worth reading. Those cases related of the blind who were made to see, and of the deaf who were made to hear, by a bolt of lightning, seem miraculous to say the least.

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HORLICK'S MALTED MILK CALENDAR FOR 1925.

We have received the 1925 Indian Calender of Messrs. Horlick's Malted Milk Company and consider it very tasteful and out of the run of the ordinary production of this kind.

The picture is the resuscitation of Gautama under the Sal tree in the Uravela wood near Gaya, by the milk-food offering of the young Indian matron Sujata with Sir Edwin Arnold's beautiful lines describing the incident gracefully printed underneath. The picture is appropriately conceived and is suggestive of the superior life-giving and life-sustaining qualities of Horlick's Malted Milk.

BOOKS RECEIVED.

The following books have been received and the courtesy of the Publishers in sending them is acknowledged. Reviews will be published from time to time [Ed. Antiseptic].

The Manager of the Antiseptic will be pleased to supply the readers any books acknowledged hereunder, at the Publisher's price. When sending their order the readers are requested to send a remittances for the full value of the book. That a remittance in advance should be requested is no reflection on the credit of any reader of the Antiseptic, but is simply a condition necessitated by circumstances.

The Insulin Treatment of Diabetes Mellitus.—By P. J. Cammidge, M.D. (Lon.) D.P.H. (Cam.).—Published by E. S. Livingstone, 16 and 17, Tevoit Place—1924—2nd Edition, Price 6 net—216 pages.

Monographs of the Rockfeller Institute for Medical Research. (No. 20)—Published by the Rockfeller Institute for Medical Research, New York, 1924.

Students' Guide to Operative Surgery.—By Alfred T. Bazin, D.S.O., M.D., Asst. Professor of Surgery and Clinical Surgery, Megill University. Published by Renouf Publishing Co., 25 Megill College Avenue, Montreal, Canada 126 Pages.

Immunity in Natural Infectious Diseases.—By D. Heralle—Price 5 dollars. Published by Williams and Wilkins & Co. Baltimore. 400 Pages.

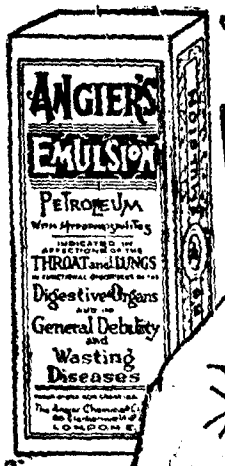
Rheumatic Heart Disease.—By Carey of Coombes. Published by John Wright & Sons Ltd. 376 Pages 12 sh. 6d net.

Castor's Instruments' Guide to the Instruments and Appliances required for Operations and the Dressing of Cases.—By R. H. Castor Lt. Col. I.M.S., Second Edition, Revised by E. P. Connor, D. S. O., Fol. C. S. (Eng.) Lt. Col. I. M S. Published by Messrs Thacker Spink & Co. Calcutta and Simla, 34 pages, Price 1 Re.

Cancer—How it is caused and how it can be prevented.—By J. Ellis, Barker with an introduction by Sir W. Arbuthnot Lane, Bart, C.B. M.S. F.R.C.S. &c., Consulting Surgeon at Guy's Hospital. Published by Mr. John Murray, Albernarle St., W. London. Price 7 sh. 6d net, 432 Pages.

Acute Infectious Diseases—A Hand-book for Practitioners and Students.—By J. D. Rolleston, M. A., M. D., (Oxon)—Published by Messrs. William Heinemann (Medical Books) Ltd., London, 20, Bedford St., London, W. C. 2. Price 12 sh. 6d net, 376 Pages.

Essays and Addresses on Digestive and Nervous Diseases and on Addison's Anæmia and Asthma.—By Asthen F. Hurst, M.A., M.D. (Oxon) F.R.C.P. Physician, and Director of Advanced Studies, Guy's Hospital. Published by Messrs. William Heinemann (Medical Books) Ltd., London, Price 21 S. net 306 Pages.



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Vol. XXII, No. 2.

FEBRUARY, 1925.

The Antiseptic

A Monthly Medical Journal

EDITED BY

U. RAMA RAU, M.L.C.

AND

U. KRISHNA RAU, M.B., B.S.

CONTENTS.

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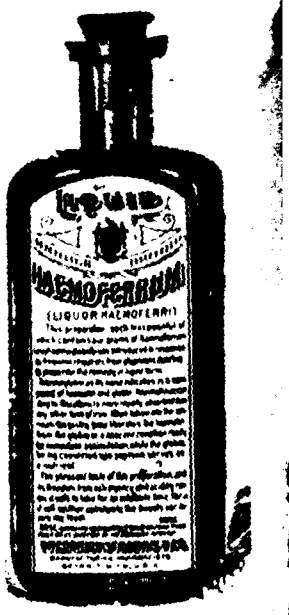

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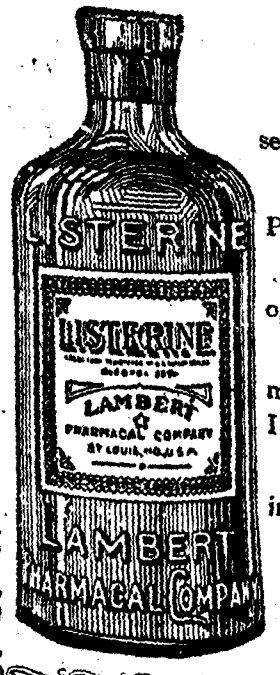

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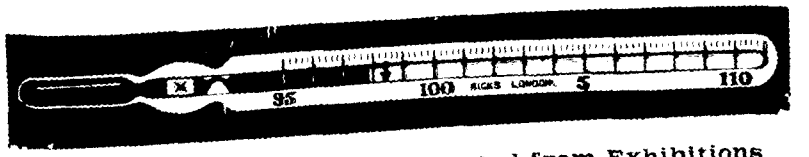

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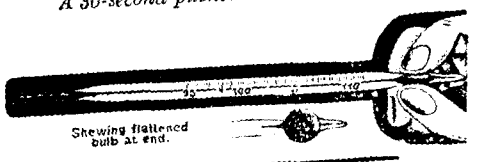

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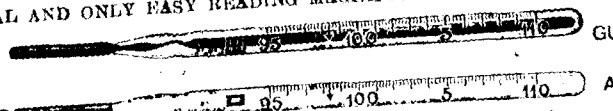

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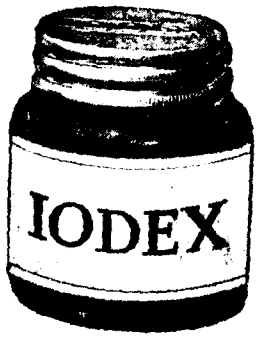

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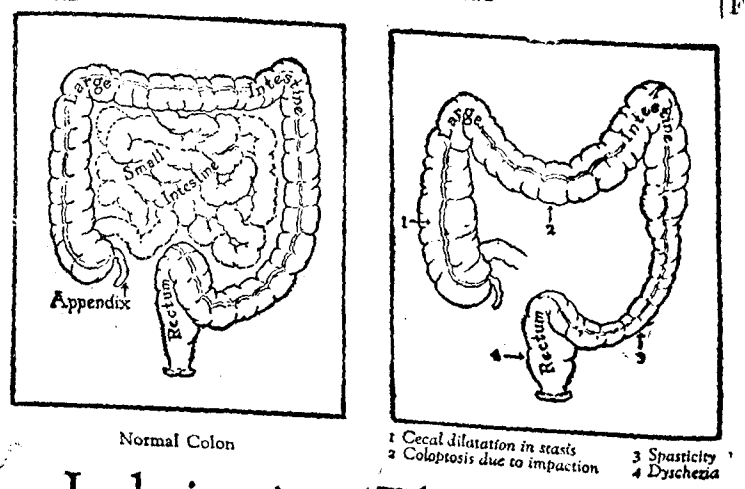

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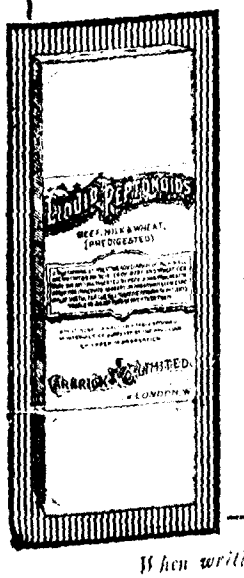

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ORIGINAL ARTICLES.

* BACTERIOPHAGE

By

ASHUTOSH ROY, L.M.S., HAZARIBAGH.

Introduction.

We are still in the dark with regard to our knowledge of "Infection and Immunity" to bacterial diseases, despite the immense work on the subject. Thus a study of Agglutinins, Precipitins and other Serological phenomena shows that there is no absolute relationship between the "titre" of antibody formation on the one hand and the degree of true immunity on the other. Further a very complex terminology, a maze of bewildering names, has grown up round the subject.

Thus we have the *phagocytes* of Metchinkoff and very recently the *Bacteriophage* of D'Herelle (of the "Cellular" School). We have the *opsonins* of Wright, the *antitoxins* of Buchver, the *ferments* of Abderhalden, the *agglutinins* of Bordet, the *precipitins* of Krans, the *cytolysins* which include the *bacteriolysins* of Pfeiffer, the *hæmolysins*, and the *Venom hæmolysins* the *complement* of Ehrlich, which is the same as the *Alexin* of Bordet, the *cytotoxins* and a host of names too numerous to mention (of the "humourous" School.)

Besides the above defensive agencies of the body, we have the *hormones* of Endocrinologists which stimulate antibody formation and phagocytosis, the *P.H.* of the Biochemists, which are favourable or otherwise to the invading germ and the defences of the host and who are trying to explain immunological reactions on the basis of colloidal chemistry; the *salts* and *vitamines* of Dietetians, which keep the host in a fit condition to repel the germ; the *hygienic environments* of the Sanitarians, in which

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the germs are always at a disadvantage and in minimum quantities. With the advance in the knowledge of modern medicine, the general practitioner in studying the subject of Infection and Immunity, is not only confronted, but confounded, with all these accumulations of expert knowledge on the subject. We will limit ourselves here to the study of a part of one aspect of the subject—*viz., the phenomena of Prof. D'Herelle* of the Pasteur Institute of Paris and *his Bacteriophage.*

THE TWORT—D'HERELLE PHENOMENA.

D'Herelle, in 1917, brought before the French Academy strong experimental evidence to show that bacteria, themselves parasitic on man and lower animals, in their turn have parasites which destroy them. That these agents or bacteria destroyers, named by him "*Bacteriophages,*" are minute-ultra-microscopic organisms, these parasites on human and animal parasites live only at the expense of living bacteria, entering them and secreting a diastatic ferment which kills the bacteria and brings about their dissolution by a digestive process. This bacteriolysis is now known as *Twort "D'Herelle phenomena"* and it is different from what is known as "*Pfeiffer Phenomena*" of Bacteriolysis, for, in the latter, although the bacteria may be broken down, they are never so completely dissolved as in the former case.

This phenomena is associated with the name of Twort, because in 1915 he had also shown that certain bacterial cultures possess power of *autolysis.* He was of the idea that an *autolytic enzyme* rises spontaneously *in* cultures, produced by bacteria. He failed to find out, what D'Herelle found 2 years later on, that it contained an ultra-minute living organism, which is parasitic to the bacteria, produces a diastatic enzyme and kills the bacteria, by a process of digestion and thrives upon and multiplies on the products of bacterial lysis.

As early as 1896 Hankin had observed in India that the waters of big Indian rivers, the Ganges and the Jamna, apparently contained a self-purifling principle, which added to the sanctity of those and other big rivers in India, existing from time immemorial in the minds of the devout Hindus. Similar observation of the properties of water of big European rivers by different observers confirmed Hankin's conclusion.

Indirect immunological factors like direct sun's rays, free ventilation along the water surface, etc., had been brought forward to explain the partial natural immunity of water of big rivers to cholera vibrios as well as other normal and abnormal germs. We now know that this is due to the presence of D'Herelle's bacteriophages. What was more or less vague, has now become definite. The claims of bacteriology which is being thrown more or less in the back-ground now-a-days, has come to the forefront again with the researches of D'Herelle.

The fundamental experiment to produce "Twort—D'Herelle phenomena" may be demonstrated by a very simple experiment as follows:—

A small quantity of excreta of a patient convalescent from an attack of dysentery or Typhoid is mixed with a suitable nutrient media, *e.g.*, sterile broth, and kept in the incubator for 24 hours, when the previously clear broth will be found to be turbid, due to growth of the specific bacteria. This culture of specific bacteria is passed through a porcelain filter, which strains off all the bacteria, and a trace of the resulting clear fluid is added to a fresh tube of broth containing a pure culture of the same specific bacteria and this is again placed in the incubator. After a few hours the turbid broth containing the culture becomes clear, *i.e.* the specific bacteria in it are found to be dissolved. A trace of the new fluid is now taken and the former process repeated with exactly the same results. This process may be continued indefinitely and always with equal success.

From the above experiment we see that the excreta of a *convalescent* patient contains some lytic agent that destroys the bacteria and that the former generates itself and destroys the latter. The presence of this agent in the excreta of *normal* animals and human beings had also been definitely proved by D'Herelle and others.

We can learn *more* about this bacteria-killing agent by repeating our first experiment *in* a slightly different way as follows:—

A small quantity of excreta in solution containing the bacteria which caused the patient's illness is spread over the surface of a suitable nutrient jelly (made of broth and solidified with Chinagrass or a kind of vegetable gelatin prepared from Japanese seaweed) and the mixture incubated. After 24 hours each bacterium deposited on the surface of the jelly will multiply into a colony, appearing to the naked eye as slightly opaque dots or patches; on further incubation the colonies enlarge, until finally the patches coalesce and the *entire* surface of the jelly is covered with a film of bacteria. If we add a little of the lytic agent we prepared *in* our first experiment, we notice a curious change after 24 hours in the growth of the bacterial film on the jelly viz., that instead of one uniform film, it is dotted with a number of clear circular areas, in which no living specific bacteria is found. These clear areas gradually coalesce after some hours and the specific bacteria on the surface of the jelly are destroyed. If a platinum needle is rubbed on the surface of the clear area and then washed off in a broth culture of the specific bacteria, it is found that the culture begins to become clear and eventually all the bacteria in it are destroyed.

D'Herelle experimented first with culture of shiga bacillus from a shiga dysentery patient. The lytic agent dissolved the shiga B, and finally reduced the pure virulent culture of the specific bacillus to limpid fluid free from bacteria and incapable of growth or transplantation.

Since D'Herelle's experiment and others of a similar nature, it is practically admitted that disease-producing germs, within the organisms of man and animals, are invariably accompanied by certain other substances of much more minute dimensions than the pathogenic organisms which are engaged in constant and often victorious struggle with the germs of disease.

The conclusion that can be safely drawn from the above two experiments, is that the substance which cause bacteriolysis, is eithera living organism or a chemical ferment. Further experiments of D'Herelle support his contention that they are not chemical ferments, but ultra-minute living organisms to which he gave the name of "Bacteriophagum Intestinale" the name merely indicating their characteristic property of killing bacteria, as well as the place where he first found them viz., the intestines of man and animals.

(1) They are minute ultra-microscopic living organisms parasitic upon many types of bacteria. As all forms of life are parasitised by other living forms, there is no apriori reason, why bacteria themselves should not be subject to parasitism.

(2) Although the living strain was first isolated by D'Herelle in connection with the parasite of shiga, it has lytic properties not only towards this bacillus, but towards many and probably all bacilli, that may attack the human and animal body *e.g*, the different dysentery B, typhoid and paratyphoid B, cholera vibrio, staphylococcus, B pestis, B coli, B Diptheria, B proteins, B Subtitis, the bacillus of avian typhosus and septicæmia, the bacillus of haemorrhagic septicæmia of buffaloes etc. It may be noted that some bacilli possess high natural resistance to bacteriophages, specially those that are specially virulent to man and lower animals.

(3) The bacteriophage is very widely distributed in nature. Although a normal inhabitant of the intestines of man and animals in both health and disease, it is present not only in their excreta, but also in contaminated earth and water and is almost universal in its distribution. Nor is it entirely confined to the intestines, but it may invade the blood stream and exert its protective action in the various tissues and organs, situated at any part of the body, according as the organism needs. It only lives and grows in contact with and at the expense of living bacteria wherever these are found.

(4) The bacteriophage is not only invisible under the highest magnification that we can command (ultra-microscopic) but is of extremely small (not infinitismal) size and is capable of passing dense filters, although it may be partially concentrated by centrifugalising at high speed.

(5) Its vitality is very great, as sealed tubes of filtrate are active six years later. It also remains active for six months in a dried condition. It can withstand temperature up to 65° C above which it is destroyed. It is somewhat resistant to antiseptics. Thus it survives in 1 in 200 mercuric chloride solution for 4 days; in 1 in 100 phenol solution for 7 days; in 90 per cent. absolute alcohol for 2 days. But it is highly susceptible to the products of bacteriolysis.

(6) Its virulence in attacking pathogenic germs is variable. When freshly prepared it is capable of attacking several species of bacteria, but displays a variable virulence for each. In convalescent patient its virulence, is severe; in ordinary health its virulence is moderate; in fatal cases it may not be virulent towards the invading bacteria or the latter may acquire resistance towards the bacteriophage.

(7) The virulence of bacteriophage for bacteria may be enhanced quantitatively, by inoculating the filtrate containing these ultra-microscopic germs into the peritoneal cavity of a guinea-pig, and after 10 to 18 hours injecting sterile bouillon and then collecting the fluid from the peritoneal cavity. When each isolated strains are added in minute quantities to "Agar slope cultures" of Shiga Bacillus, spotted areas of non-growth appear at the culture. Further if bacteriophage and shiga emulsion are kept in contact for a few hours, no growth of shiga B takes place.

From these areas of non-growth, an emulsion of the bacteriophage can be made which under dark ground of the microscope, shows merely ultra-minute visible points, but which possesses the property of complete lysis of bacteria.

(8.) The bacteriophage is an organism and not a chemical ferment. That the virulence of these agents can be increased quantitatively is also true of enzymes in general under proper conditions and this is one of the reasons which led some workers to regard the agent as an enzyme and not a living organism as regarded by D'Herelle.

THE BACTERIOPHAGE IS NOT AN ENZYME.

This is shown by the following facts:—

(1) It has been shown that the bacteriophage is not in solution but exists as minute particle in fluid like Bacterial Emulsion, thus differing from enzyme.

(2) It will survive in a mixture of equal parts of glycerine and saline, but is soon destroyed by pure glycerine, thus differing from ordinary enzyme.

(3) It can be cultivated in serial cultures as we have seen in our study of the experiments mentioned previously.

(4) Its resistance to destructive agents resemble those of bacteria and not of ferments.

(5) It is particulate and D'Herelle gives an exceedingly ingenious method of enumerating and standardizing the colonies, not by counting the number of colonies obtained as with an ordinary bacterial emulsion, but

by mixing standard emulsion of the Shiga B, and standard dilution of bacteriophage filtrate and counting the number of areas of non-growth.

(6) The P. H. range of Bacteriophage differs from that of enzyme, but comes into line with those of living organisms.

(7) Strains vary in virulence, both for the same strain at different times and for different strains isolated from the same patient at different times.

(8) It is not an enzyme product of leucocytosis since it is itself subject to phagocytosis by leucocytes.

(9) The bacteriophage produces lysis not of one variety of bacteria, but several varieties, probably all that infect man and lower animals.

(10) The bacteriophage concerned in lysis of different bacteria is not a series of different ultra-minute organisms, but one single species with adaptability to assume different morphological aspects.

How bacteriolysis is performed by bacteriophage.

According to D'Herelle, the bacteriophage penetrates into the interior of a bacterium and forms a colony of 15 to 25 elements in the space of an hour or so. The bacterium then bursts, liberating the young ultra-microbes. These utilise for their development the bacterium which they dissolve with the aid of lytic diastatic ferment which they secrete.

According to D'Herelle there is only one species of bacteriophage, and this can acquire activity against any organism, and not a series of different ultra-microbes.

At the present time an enormous number of different strains of bacteriophage has been isolated. Thus one strain may act more energetically against culture film of one species of bacteria than a second or a third strain. Each of these strains will produce on the film an entirely distinct and characteristic appearance. If now these strains are mixed up and made to act on a single film of the same kind of bacteria, their characteristic effects appear quite distinctly and it seems impossible to believe that one species of bacteria could produce so many clinical solvents.

Bacteriophages have been found against almost any type of bacteria and every strain presents some peculiarities that distinguish it from other strains. Thus there are bacteriophages that act on one species of bacteria and some of them even limit to one particular strain of one species and we can thus isolate many different strains of bacteriophages, which act in different ways on one and the same strain of bacilli.

This is explained by the varying adaptability of the bacteriophage under different conditions, which explains the various role it plays in human and animal life in health and disease. This is illustrated as follows:

In the human intestine the bacteriophage lives on B. coli which is always present there. Suppose for example a man contracts typhoid which begins to multiply in his intestines and gradually inhibit the growth of B, Coli. Owing to adaptability the bacteriophage of B. Coli now begins to acquire the faculty of using Typhoid B as food. In the intestines the struggle begins between the two and the course of illness is a reflection of this contest. If the conditions are favourable to the bacteria, there is aggravation of the disease; if the bacteriophage acquires this new activity of killing Typhoid B, convavalescence begins. Other factors of course play a part for the disease process and recovery is very complicated.

Bacteriophage and Infection.

Just as in an epidemic the entire population of a place is not affected and some escape by resisting the infection, so some bacteria may escape the lytic action of the bacteriophage and thus enter the organism. These multiply and produce an immune strain of bacteria even more virulent than their ancestors and induce the disease. When the bacteria thus acquires resistance, it changes its morphological characters. Thus it takes a "cocoid" aspect and becomes surrounded by a capsule. It becomes inagglutinable and resists phagocytosis. When it loses its power of resistance, the bacteria returns to its normal forms and properties.

D'Herelle states that in the case of carriers of cholera, typhoid, etc., the specific pathogenic bacteria becomes resistant to the lytic influence of bacteriophage.

Hence D'Herelle states that besides the ordinary defensive agencies of the host, the pathogenic bacteria must overcome the additional defensive agency viz., the lytic action of the bacteriophage before infection can take place.

Further it is found that the number of bacteriophage is greatly increased after an infection has occured and is therefore regarded as playing an important role in the recovery from disease.

According to D'Herelle infection with death or recovery depends as to whether the bacteriophage gets the upperhand or not. Further, the products of bacteria which have been dissolved by the bacteriophage play an active role in stimulating formation of antibodies.

To D'Herelle, therefore, the question of infection is simplified into the struggle between the agent of infection (the infecting parasite) and the agent of immunity (the bacteriophage). The vicissitudes of the struggle are reflected on the condition of the infected individual. Convalescence begins where the virulence of the bacteriophage is sufficient to give it definitely the upperhand. The disease has a fatal outcome if the bacteriophage is inactive as a result of unfavourable conditions or if the bacteria acquire a refractory activity.

The outcome of an epidemic depends on the two factors viz., the agent of infection and the agent of immunity. Both these agents, the specific pathogenic bacteria and the bacteriophage can spread from one individual to another.

In relation to infection Kolmer states that the work of D'Herelle has shown that in vitro at least, filtrates of culture of fæces may digest bacteria and that filtrates of the digested bacteria, in turn, will digest cultures of various bacteria in succession. The lytic agent is filtrable. Whether it is a living parasite or an enzyme is not definitely known. Whether it exerts an appreciable or important role in natural resistance to bacterial infection in general and intestinal infection in particular cannot be definitely stated. Probably it exerts some protective activity and when present, must be overcome, in case of infection occurring by way of the gastro-intestinal tract. It may also exert a more important role in the recovery from intestinal infection, although according to Davison the oral administration and subcutaneous injection of the filtrate have not been proved curative in the treatment of bacillary dysentery of children.

THE LYSIN OR DIASTATIC FERMENT.

The exact nature of the lytic agent, says Kolmer, whether a *bacteriophage or a bacteriolysant* is not known—D'Herelle regards the lytic agent as a diastatic ferment produced in living bacteria by entrance of bacteriophage into them. It is precipitable by Alcohol, resists heat 58° C and is regarded as possessing a powerful opsonic action on bacteria, for which the bacteriophage possesses virulence.

THEORIES WITH REGARD TO THE NATURE OF THE BACTERIOLYTIC AGENT.

(1) Twort originally favoured the idea that it is an autolytic enzyme produced by bacteria and thought that it may arise spontaneously in cultures. More recently he has stated that probably D'Herelle's explanation is the more probable.

(2) Kabeshima suggested that bacteriolysis is due to interaction of a catalyst present in the faeces of patient and a pre-ferment produced by some intestinal fluid or by leucocyte as a protective measure against infection and found that the lytic substance could withstand being heated to 70° C and the effects of precipitation and antiseptic substances, all of which suggest a ferment.

D'Herelle refused to accept this hypothesis, not only because a living microbe may possess all these physical properties, but because it fails to explain the serial action by the fact that the same lytic agent can act on diverse bacterial species,

(3) Bordet and Cluca suggested that the ability to produce lytic substance was acquired by bacteria, as a result of contact with some external stimulus, *e.g.*, a leucocytic exudate. This external influence possibly represented a defence mechanism on the part of the animal. The bacteria are then able to transmit to their descendants the aptitude to form this lytic substance or their aptitude for autolysis. Inasmuch as this substance is defensible in culture media in which such a microbe had grown, it would confer ability to produce this substance upon allied bacteria placed on the medium and these in turn to others.

D'Herelle refuses to accept this hypothesis also for various reasons, one of which is that it does not confirm to experimental facts.

(4) Bail accepts D'Herelle's claim that the bacteriophage exists in the form of autonomous masses and conducts itself as ultra-microscopic, but states that these particles could only be constituted by the spitter *i.e.*, by particles derived from digested bacteria themselves. These organized particles, capable of reproduction under a filtrable form at the expense of the same bacteria, secrete a lytic diastose.

D'Herelle states that acceptance of this theory requires strict specificity on the part of the bacteriolytic agent and numerous experiments have proved it otherwise.

It is apparent therefore that the various theories are divided into those regarding the bacteriolytic agent as an enzyme produced by bacteria and those agreeing in principle with D'Herelle that lysis is indeed caused by a diastatic ferment, but this ferment is produced by a newly discovered parasite of ultra-microscopic size characterised by its ability to penetrate living bacteria only.

(5) Kolmer sums up the position as follows: According to data available at present, the phenomena of lysis depends on a bacteriological enzyme produced by cultures, which can be increased by external influences *e.g.*, intestinal secretions, tissue extracts, leucocytosis &c. The action of these external influences is probably to favour development of lysogenic organisms at the expense of the non-lysogenic. This enzyme not only dissolves organisms, but favours multiplication of bacteria which produce the enzyme. In this way the bacteriolytic principle is carried along from generation to generation. It is highly probable that this phenomena represents a defensive mechanism on the part of the animal against bacterial infection.

ANTI-BACTERIOPHAGUS SERA.

D'Herelle claims to have produced an antisera for the bacteriophage by infecting filtrater into lower animals. These antisera were found to possess complement fixing antibodies for bacteriophagous antigen and capable of neutralising, but not killing the bacteriophage.

PRACTICAL APPLICATION.

We are not yet sufficiently acquainted with the biology of the bacteriophage to make free practical use of it as thereapeutic agents for different diseases without the risk of injury. In the meantime the experiments that have been made to test the therapeutic capability in the case of man and animals, afford every promise of success. Thus a few cases of human dysentery where the use of bacteriophage had been tried by D'Herelle, produced very good effect, *e.g.*, the diarrhœa ceased within 24 to 36 hours after administration of bacteriophage and no more dysentery B was found in the excreta.

Since the bacteriological agent is transferable from one individual to another, D'Herelle believes that it is possible to confer resistance, a heterologous anti-microbic immunity by administering filtrate causing the agent. The immunizing cultures used by ingestion or injection contain the bacteriophagous ultra-microbes plus soluble substances derived from the destroyed bacterial bodies. D'Herelle and others found that the filtrations are well borne by animals in large doses by oral or subcutaneous injection. D'Herelle states that the administration of the bacteriolytic agent ought to prove curative when administered early in the treatment of disease. Davison was unable to detect any curative activity in dysentery of children. D'Herelle's claims are yet unproved and the true relation of the bacteriophage to immunity and the treatment of disease are still as obscure as the nature of the agent itself.

CONCLUSION.

It is little wonder that D'Herelle's exposition has aroused strong criticism, some of which we have discussed, as well as interest, for if his contentions are confirmed, it will revolutionise our ideas of Immunity and our methods of Immunization.

D'Herelle's work cannot be lightly dismissed. In his book one is led to experiment after experiment, step by step to the conclusions at which he arrived, which though amazing in their present and future importance, yet rest upon a large and careful experimental basis. If D'Herelle's conclusions are accepted, the inferences are tremendous, *e. g*,

1. Our idea of infection and immunity will be radically changed.

At present no relation exists between the different antibody formation and the degree of true immunity. The real immune principle in the serum resides in its anti-toxic property against both exo-toxin and endoxin set free by lysis of bacteria. The bacteriophage is an obligatory parasite which always comes to the rescue. Its role is strangely parallel to the apsonin of Sir Almroth Wright.

From a study of D'Herelle's bacteriohpage it appears that Immunity consists of 2 elements:

(a) Phagocytosis of the invading bacteria by leucocytes.

(b) Bacteriolysin of the invading bacteria by the invisible bacteriophage, its virulence increasing in convalescence but being lost in fatal cases.

(ii) *The therapeutic possibilities are immense.* This can be deduced from D'Herelle's experiments:

(a) In bacillary dysentery and enteric, a daily study of stools show that the number of stools daily passed and the virulence of the bacteriophage are in inverse proportion.

(b) In epidemic dysentery the immunities show a bacteriophage of high immunity. In diarrhœas of such epedimic the bacteriophage comes in and conquers the infection.

(c) In avian typhosis, chickens show a bacteriophage of high virulence as also in convalescence, while in fatal cases, the bacteriophage is of little or no virulence.

(d) Experimental immunization of chickens against avian typhosis shows amazing results, *e g.*, sick foul recovered, epidemics stopped when all the birds were immunized by inoculation.

(e) In haemorrhagic septicaemia of buffaloes the bacilli are found in contaminated soil as also the bacteriophage, and a highly virulent strain can be isolated from convalescent animals.

The results of experiments on man are of greater interest:

(f) One injestion or injection in large amount shows no toxic reaction, a statement which cannot be made for a Shiga bacillus vaccine even if detoxicated.

(g) Injection of 2 c.c. of bacteriophage during an outcome of Shiga dysentery near Paris shows wonderful results, *e.g.*, the attack ceased, the stools were reduced to one to two only in 24 hours, and these became formed in 3 days.

These are extraordinary results though it cannot be denied that the cases in which this method was tried were extremely few (seven only in number.)

Hence the Editor of the Indian Medical Gazette asks *are we on the thresholt of a new discovery?*

We can use antiseptics to destroy bacilli; we can use immune sera which may confer a temporary and passive immunity, we may employ bacterial vaccine to which the patient may reach by an immunizing response. It remained for D'Herelle to show that we are in a position to injec

of treating, there can be no doubt that within a few years, with improved technique and greater care, the number of cases treated with X-rays will be much increased and the number of cases where a surgical interference is preferable will be reduced. Undoubtedly carelessness, want of knowledge, skill and experience in the application of these rays have claimed numerous victims already. But the benefits of its careful and intelligent use are greater. To be successful in this therapy, especially for deep malignant growths, a mastery of the correct dose, quality and direction of the rays is necessary. Medical men can certainly learn it within a few months. Hence a brief account of the Technique of Roentgen therapy will be welcome.

X-rays act like a poison on animal tissues and if a sufficient dose is applied on any part of the body, blisters, inflammations and many other destructive changes take place. But the susceptibility of the different groups of cells varies a good deal. Young and rapidly growing cells are more susceptible than the older ones. Hyperaemic tissues are more susceptible than the anaemic. It is due to this variability that X-rays are useful as a curative agent. The biological effects of the X-rays are in proportion to the quantity absorbed. A weak dose stimulates, a medium dose paralyses and a strong one kills the cells. The quantity which is absorbed by the tissues depends on the intensity of the rays reaching them, the duration, their quality and on the size and density of the tissue. For practical purposes it is reckoned as unit, the dose which produces an erythema of the skin. Every tube should be tested and the duration to produce an erythema dose under the necessary conditions, should be noted. The conditions are the distance, strength of current, filter used, etc. For the methods of standardizing the tubes, X-ray manuals may be referred. Generally tubes with equivalent sparks of about 20cm, and aluminium filters ·75 to 3 m.m. are used for the treatment of skin diseases. If the action is desired only up to 1 m.m. below the skin filters are not necessary when fairly hard tubes are used. But to have the action up to 2 m.m. deep, filters of 1 m.m. aluminium should be used; and to have up to 3 or 4 m.m. below the skin filters of 2 to 3 m.m. aluminium should be used, to stop the rays which would otherwise be absorbed by the skin and might cause an erythema before the tissues 3 m.m. lower are reached by the required dose. It is also important to note that filters which are thicker than 4 m.m. aluminium should not be used for skin diseases, except in cases of malignancy which has infiltrated much lower down. Because otherwise rays of too great a penetrating power would reach the healthy organs deeper down unnecessarily.

In addition it is absolutely necessary to have a homogeneous irradiation over the diseased area e.g., in epilation for ring worm if a

small patch is not reached by a sufficient dose, the disease is likely to extend again from this focus. Analogous conditions exist in many other conditions. It is almost impossible to correct such errors with subsequent exposures; because the sensitiveness of the skin becomes changed by the first exposure and remains so for several months. This evenness of distribution of the intensity of the rays can be had only if it is spread over a circular concave area with the anticathode in the centre of it. But in actual practice, one cannot always hope to get concave areas. On the other hand, one has to deal with level surfaces or sometimes convex surfaces as on the scalp. In such conditions the central ray falls perpendicularly on it and the middle of the area receives a greater intensity than the spots at the periphery, because the rays have to traverse a greater distance and also because they being oblique have a smaller intensity than those striking perpendicularly. But this difficulty can be avoided by choosing large distances between the anticathode and the skin; but again the duration and exposures are thereby increased. Moreover with convex surfaces even the longest distances will not give satisfactory results. To have a satisfactory irradiation the distance between the anti-cathode and the skin should be at least twice as long as the diameter of the diseased area; and if the diameter exceeds 15 c.m., the area is better divided into several smaller fields, to be exposed separately. Too many different focal distances should not be used to avoid unnecessary calculation. It is a good plan to let these exposures to overlap the adjoining areas. Because though the intensity of the rays diminishes the further they are from the central rays and hence the periphery of each area gets lesser intensity, this difference is made up by over-lapping. Even the convex surfaces can be subjected to sufficiently homogeneous irradiation in this way.

To produce permanent epilation, each part should be irradiated at least three times with intervals of a few weeks. The Dermatological Clinic of the University of Zurich reports that cases of Rodent ulcer were successfully cured by using tubes with an equivalent spark of 33 cm, aluminium filters 3 to 4 mm thick and by giving about 2·3 Erythema doses for each case.

From the results obtained from thousands of cases at Erlangen, it is proved that certain definite doses are necessary in deep therapy.

34% of the Erythema dose for sterilization of the ovaries.
60 to 70% " " for sarcoma to disappear.
90 to 110% " " to make carcinoma disappear.

But in actual practice it is a difficult problem to apply these doses to deep-seated organs without injuring the skin, the superficial layers, and the parts surrounding the organs, e. g. for a carcinoma of the uterus a strong dose which will produce erythema of the skin has to penetrate 8 to 10 cm

an emulsion of living bacteriophage, a product which given under suitable circumstances, will multiply readily and in so doing will destroy and live on disease-producing bacteria. *Such an advance in therapy will revolutionise our treatment of bacterial disease and our conception of infection and immunity.*

Truly the ways of the Almighty are wonderful. If there had been no bacteriophage, the pathogenic bacteria would have spread all over the world and multiplied in such numbers that human and animal life would have been impossible to thrive in the world and would have been wiped out soon.

LIST OF REFERENCES.

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* X-RAY THERAPY

By

B. GURURAJA ACHAR, MADRAS.

William Conrad Roentgen discovered X-rays thirty years ago. Since then it has done wonders. It has diagnosed what the stethoscope and many of the modern diagnostic instruments could not; it has healed many ailments, which the ointments and balms failed to do; it has penetrated to all those parts where the surgeon's knife stopped short.

The results of the therapeutic use of X-rays in skin diseases such as acne, lupus, epithelioma, etc, as well as for tubercular glands and other superficially placed diseased tissues are so excellent that the use of X-rays in their treatment is growing steadily. Ten years ago satisfactory results with X-ray treatment for deep-seated lesions were only occasional. But during the past few years much has been done in this direction as well. The Gynæcologist gained a good deal. The results obtained from a large number of cases at Erlangen, Vienna etc., are excellent. In the treatment of excessive haemorrhage due to the approaching climacterium or to fibroids or myomata not a single failure or mishap is claimed. And in those advanced cases which are beyond surgical help 12% could still be cured. Occasionally the process may be slow. But in 32% of the cases no trace of the growth was found and most of the symptoms disappeared within twelve months. Sterilization of the ovaries is done fairly easily with the X-rays. But the deepseated malignant tumours offer

*Specially contributed to "The Antiseptic".

much greater difficulties, partly because they are less sensitive to X-rays, and partly because it is impossible to say how far the malignant cells might have already invaded the healthy tissues in the neighbourhood. For this reason surgeons remove larger and larger parts of the surrounding tissues; but the knife has to stop short of many important organs; whereas the X-rays can traverse them with impunity as long as a certain dose is not exceeded; and they can do this work more efficiently and over a larger area than the knife. But still opinions differ as to whether and if so to what extent X-rays are preferable to a surgical operation in these cases. Profs. Seitz and Wintz of Erlangen obtained better results with their methods of treating malignant growths with X-rays, than have been recorded elsewhere. Of course if metastases have already started, X-rays are powerless. Because the patients cannot stand the doses required and it is impossible to treat a large part of the body without injuring blood etc. As yet we cannot definitely conclude as to the value of the X-rays in combating malignant growths. But the results obtained so far are more favourable than the surgical operations, especially with the malignant growths of the uterus. The prospects of a cure with X-rays is greater in the case of a sarcomatous growth than a carcinoma. The results obtained with the carcinomas of the ovaries, the rectum, the breast etc. are not so good; only temporary improvement and deviation is obtained. But we hope for better results, with improved technique, in these cases as well. Few permanent cures in these cases also are reported. At the same time some cases of carcinomas especially those of the larynx have been made worse with X-ray treatment. In spite of these failures, X-ray treatment of malignant diseases is steadily advancing, because X-rays are a powerful weapon in fighting malignant growths. Some cases which have been sent by the surgeon, as hopeless, to the X-ray specialist, have become operable and some cured after X-ray treatment. The number of these cases are no doubt but few; but we should remember that these figures refer only to cases considered as otherwise hopeless, that a number of these patients were already in a very low state of health at the commencement of the treatment, and others do not come regularly at the appointed time for another exposure. When the pain has ceased and the tumour disappared they consider themselves cured; and when they return again, it is too late to do anything.

Statistics and experience prove that a combiation of surgical and X-ray treatment offers better prospects of a permanent and speedy cure than can be obtained with either of these methods alone. A discussion of the difference of opinion about minor details is not within our scope.

With such excellent results it is no wonder that patients prefer X-ray treatment to surgical. And considering the ease and certainty

below the surface. To apply such strong doses to the deep organs, it is necessary to use apparatuses and tubes that will produce a good quantity of hard X-rays. For an account of these apparatuses and their adjuncts the readers are referred to X-ray Manuals. With currents of 1,80,000 volts or more and highly exhausted tubes with an equivalent spark gap of about 40 cm., the X-ray waves of the greatest intensity have a length of about 0·10 A. U. and are very rich in rays of great penetrating power. When these are filtered through ·5 mm. of zinc or copper, rays of soft and medium penetrating power are absorbed so far that only rays which are homogeneous are exposed.

There is another practical difficulty to be solved in deep therapy. Even the hardest rays are weakened to a great extent by the increasing distance and by absorption; and it is often difficult to get at a depth of 10 cm. even 25% of the intensity at the surface. If we continue the exposure through the same part of the skin until a carcinoma of the uterus had received 100% of the Erythema dose, the skin will get 4 or 5 times this dose in the meanwhile, resulting in a severe burn with ulcers, which will be as bad, if not worse, as the malignant disease and equally painful. This difficulty can be overcome if the total quantity of the X-rays to be administered is not allowed to enter through the same part of the skin, which can be accomplished by concentration of the rays through various windows, or what is known as a "Cross fire," can be directed on the deep object from several points on the surface, by altering the position of the tube and of the diaphragm after one part of the skin has received about 90% of the Erythema dose. With a sufficient number of windows, we can apply even at a depth of 10 cm., doses even greater than the Erythema dose, without exposing any portion of the skin to more than 90% of the Erythema dose. The number and size of the windows depend on the strength of the dose required, on the position of the diseased organ and on the ratio between the surface intensity and the effectual intensity available at the depth, *e.g.* if the latter is 20% of the former and we wish to apply 100% of the Erythema dose we have to use 5 to 7 windows. If the organ is the uterus, three of these can be selected on the abdomen, two on the back and one from each side or one through the vulva. In the case of the ovaries the 34% required for sterilization can easily be obtained through two windows for each ovary. Unlike the exposures for the skin, between the adjoining windows a space of 3 to 4 cm. should be left free; otherwise the tissues which are only one or two c.m. below the surface may receive an overdose, if the cones of the rays overlap very near the surface. The windows should be such as to have the cone of rays large enough not to miss even a small target, when the direction of the tube has

been carefully adjusted and to include the whole of a malignant tumour; at the same time, it should not also be unnecessarily large, so as to enable us to find room for a sufficient number of windows on the surface and also to avoid exposing unnecessary quantity of tissues. The ideal treatment of deep malignant growths would be to expose the whole abdomen to a uniform dose of sufficient strength. This can be done by giving 4 exposures c. 60 c.m. distance from the front, back and the sides, but the injuries become very large and the patient may succumb. A compromise has therefore to be made.

The percentage of the rays arriving at the depth depends on the diameter of the cone, because the greater it is the more scattered will the rays be. With a distance of 23cm. between the anti-cathode and the skin we can obtain 20% of the surface dose at a depth of 10cm. when the diaphragm has an aperture 50cm. When this opening is 80cm. the intensity will rise to 23% and when it is 150cm. the intensity will rise to 25%. For sterilization of the ovaries the dose is very small; hence, no harm will be done to the surrounding organs if the dose exceeds 100% slightly. But it is quite different with carcinomas. Fully 100 to 110% is required to make the tumour shrink. And if it were to exceed slightly by carelessness, the bowels will be severely injured. Therefore the success of the treatment depends on supplying a dose of sufficient strength without injuring any other parts. This depends on the selection of the diameter and direction of the cone of rays. The direction of the cone should be chosen so that the same part of the sensitive organs are not included in the cones from too many windows. A high percentage of failures in X-ray therapy is undoubtedly due to mistakes which have been committed in this respect. The intensity of the doses given in each window should be so considered that the sum of all the exposures reaches the intensity required. Tables are available and various diagrams exist, to show the penetrating powers, areas of windows, and distances. They will be undoubtedly of great help to obtain a better understanding of the distribution of the intensities in the various organs.

As for the duration of the exposures it can be obtained by simple calculation, when it is known in what time an erythema can be produced with a given tube and what percentage of the surface dose will penetrate to various depths, and the amount of the intensity required for the particular case.

It is evident from what has been written above that there is many a pitfall in X-ray therapy and it is not surprising that a larger number of injuries have already been caused. No doubt the more severe injuries are more or less confined to therapeutic exposures. Hence it may be concluded that in this most important and up-to-date therapy, vast experience and knowledge, great care and extensive skill are required.

CASES AND COMMENTS.

A CASE OF RECURRING ENCYSTED VESICAL CALCULUS

By

KANTHIMADHINATHAN, L.M.P., ANANTAPUR.

A young lad by name Naranappa, aged 16 years, was admitted in this Hospital on 3—12—24 for a persistent fistulous opening in the hypogastric region, through which urine was always dribbling and soiling his clothes. On 13—3—1921 he was admitted in this very same Hospital for stone in the bladder and a big stone weighing 6 drachms 13 grains was removed by suprapubic cystotomy. The bladder and abdominal walls were closed and the boy was discharged cured on 19—3—1921, the wound healing by first intention. For two years he was doing well and passing urine quite comfortably. In the middle of 1923, he began to experience the old urinary trouble and as the days advanced he felt quite uncomfortable and suffered much from difficult micturition. About the month of January 1924, he felt excruciating pain in the hypogastric region which began to swell up. On applying poultices, the swelling gave way, in the same site of previous operation, to ulceration through which urine was coming out freely. A fairly big stone was perceptible through the wound. This state of affairs continued for some time. In the month of September 1924, on a particular day, there was acute retention of urine owing to the blockage of the suprapubic wound by the stone and urethral obstruction as well. When the boy strained to his utmost in his anxiety to drive his urine out, out came a big stone through the abdominal wound, with a rush of urine. The boy says, that as a result of the stone coming out through the abdominal wall, a big ulcer was formed and did not heal properly for a long time.

At the time of admission, it was found that a small fistulous opening, surrounded by a thick scar tissue, 2½" by 1½" as a result of a long-standing ulceration, ran deep into the bladder. The boy brought with him the stone said to have been passed through his abdominal opening. It weighs 7 drachms and 50 grains and is of phosphatic origin.

For about ten days, even after antiseptic dressings, the fistulous opening did not show any sign of healing. On passing a probe through the fistula, it went deep into the bladder and hit on a stone in the bladder. It was found by sounding per urethra that some more stone was encysted at the mouth of the bladder, making the sound difficult to pass into the bladder. Rectally two stones were felt in the prostatic region and made to grate each other on moving. On trying to wash the bladder, boric lotion was not going freely inside, neither did

it fill the bladder. A grooved director was passed through the fistulous opening until it unfringed on the stone and the bladder was laid open with the knife passed along the director. On passing the finger into the bladder, the stone was not lying free on the cavity but was found encysted under cover of mucous membrane in the posterior wall near the neck of the bladder. The cavity of the sac containing the stone was communicating with the bladder through a small opening. This opening was enlarged and two phosphatic stones, weighing 1 drachm 45 grains were removed with some difficulty. The bigger one of the two stones had to be pushed into the bladder by insertion of the finger into the rectum.

The suprapubic wound is healing beautifully well and the boy passes most of his urine through the urinal passage.

I am much indebted to Dr. U. Ganapathi Rao, B.A., L.M.S., District Surgeon, Anantapur, for his kind permission to publish this, one of his operated cases, which stands unique on account of the recurrence of the stone three times, the last one being encysted in the course of three years in such a young boy.

ROSE-BAY—ITS THERAPY, SPECIALLY IN RELATION TO FILARIASIS

By

AUSHUTOSH PAUL, PURI.

As I received a lot of correspondence from medical men enquiring of the Rose-bay and as the name is to be confounded with the sweet scented Oleander, also called Rose-bay in some Dictionaries, I think, I should publicly declare that it is not the sweet scented Oleander. It grows in some valley of Mount Everest, as informed to me by Brigadier General Bruce in a letter dated the 7th May 1922, from Rongbuk Glacier Base Camp. In medicine, it was introduced long ago and is known as the beautiful Siberian rose. The dried leaves and flower buds are the officinal portion of the plant. It contains *Andromedotoxin* which resembles Aconitina.

It is anti-rheumatic and it has a high native reputation for gout and rheumatism and in *neuralgia* of the extremeties. Chronic affection of the testes as orchites and hydrocele have also been cured by it. It is also useful in constipation, where the stools are loose but require much *pressure* for their expulsion. Its action on Filariasis has been already narrated in my paper on "Filariasis—its treatment" published in the "Forward" of the 21st December 1924 and reproduced in the *Hindu* of the 25th December 1924 and I need not repeat it.

In conclusion, I must express my gratitude to the Editors of the journals who published my paper on the subject and to a host of doctors, especially of the Madras Medical Service, who are willing to adopt my method of treatment and try it in Filarial disease, which is a great scourge in many parts of India, chiefly in the Madras Presidency and South India.

The success which I claim in the treatment of Filariasis needs to be corroborated by the verdict of the medical profession and I shall be highly obliged if the medical fraternity kindly adopt my method of treatment and give their verdict to the suffering humanity.

I have seen that it helps where Antimony fails, and in my opinion, it should be at least an adjunct to antimony treatment, if it cannot displace antimony in the treatment of Filariasis. As an accessory method, a *neem* steam-bath or a steam-bath seems to be very promising as well. A remarkable cure of Filariasis has been brought to my notice by a letter from Mr. G. A. Vaidyaraman, B. A. of Madras by adopting the neem steam-bath, after the best medical treatment. The patient has remained free from the disease for 30 years, as reported.

YOUTH WELFARE

By

KIRPAL SINGH, L. S. M. F. (PUNJAB) GUJRANWALA.

In your last issue there was an article on child welfare. Indeed it is one of the problems of National Health. I wish to bring to the notice of the readers of your journal a similar problem of Ill-Health among youths.

It is admitted on all hands that the youth of to-day is not half so strong as the youth of fifty years ago.

The signal appearance of a present day youth bears testimony to this statement.

The cause of this ill-health is accounted for by different persons in different ways.

The sin of the age is drunkenness, as asserted by the Temperance and Pulpit Orators.

With my short experience as a youth who was born in one of the sturdiest races of the world, had spent 10 years in one of the best schools, mixed for full 7 years with youths of my age, I can say with certainty that 50% of the youths abuse themselves. The most crowning curse of human race is the sexual sin of self-destruction, and self-abuse. It may be of two kinds, social and personal.

See the condition of the youth who goes to school with a quite innocent little heart and with great zeal and ambition to reach the highest destiny of life, but no sooner he is taken in the company of those who have already entered the filthy altar of the gods of Licentiousness he is gone.

The animal has an impulse and must yield to it. Every thought by its presence in the mind tends to pass to an act unless it is not hindered by the presence of some other thought leading to some other direction. The period of puberty and adolescence is usually a difficult one for all children. At this time they are often romantic, idealistic and also quite unstable emotionally with poor self-control.

Auto-Eroticism is quite common at this time. It is horrible to mention the various devices that are sought for the sexual satisfation as the use of hand, a wide mouthed bottle, a pillow, a bed and various others for the simple mentioning of which the humanity is ashamed at large.

Night emission is another name for sexual satisfaction. Emission from super-abundance of vitality is quite physiological.

Fond parents may imagine that because their children are not allowed to run along the streets and are guarded carefully in the precincts of the house they are quite innocent. Visits from neighbouring children, allowing two to sleep together, to have friends to come through backdoor, all these are opportunities sufficient enough to sow the seed of ill-abuse. The vice begins from home. The parents allow their children to take stimulating condiments and excess of meat which have an influence in heating blood and stimulating the nerves. Simple tobacco can produce unnecessary stimulation to the sexual instinct. Further tobacco smoking leads to bad society.

In short the real cause is ignorance. The parents wish to keep the secret to themselves. For how long will youths believe in children descending through the chimney sweeps or that the doctors bring them in their bags? With simple curiosity they begin their downward course to destruction. They know that they are doing ill but they can't resist.

Self abuse and involuntary emissions are harmful because the act makes a high loss to the general nerve force. Palpitation of the heart and vericocele generally result.

In the end a serious form of neurasthenia develops so that he can no longer do his work owing to forgetfulness. The continued practice interferes with the development of good moral tone, mental dullness and ideas of committing suicide. He gets excited soon and emission ensues with an after depression and terrible self-reproach.

After a year or so he assumes the awful face of a wretch, with deep sunken eyes, pale face, round shoulders, hollow chest with crackling and loose joints. Desire at the end was a malady because he forgets that every

action of the common day marks or unmarks character and that therefore what one has done in secret chamber, he has some day to cry aloud on the house tops.

The other vice is prostitution which I am certain is not present among so large a number as the solitary and personal.

The condition of the youth in this vice is quite obvious; he loses purse, sexual power and gets infected with venereal diseases as Syphilis, Gonorrhoea and other allied affections.

As to the condition of the prostitute it is apparent. As long as they are young and handsome there are many calls on them but no sooner the destructive hand of Nature plays its awful mark on them in the form of old age then they roam from place to place in search of broken victuals from a rich man's table. Those infected suffer for their whole lives, pain upon pain, agony upon agony, the dreadful disease irresistably eating its way into the very life itself until a lingering death mercifully drops the curtain on a sad and ruined life. It is said wherever there is sorrow though that of a child in some home weeping over a fault that it had committed the whole face of creation is marred.

Is it not the duty of all the practitioners who are fully conscious of the evils to co-operate with the social workers to reduce the evil? As to the treatment it can be

Physical and Educational.

There are so many quacks who advertise in the best of journals, stand at the market place, at the fairs and entice young man and rob them of their hard-earned rupees.

Physical treatment consists in the examination of the genitals for any irritation due to prepuce. If so it should be treated by circumcision or dilating the pin hole prepuce as the case requires. The other methods that can be resorted to, are tying of hands at bed time or by arranging him not to sleep single or by asking him to sleep on a hard bed or some hard substance may be tied on his back during sleep.

Drugs should not be relied on. Free open air exercise and attention to other hygienic measures are useful.

Blistering the penis is resorted to by some but it is brutal.

The other treatment is educational. Religion is a great help but many a patient shows a formal and not a genuine interest in religious matters.

CHYLURIA CAUSED BY ASCARIS LUMBRICOIDES

By

Dr. Abani Mohon Das, L. M. F., The Anna Purna Pharmacy, Nawabganj Road, Dacca.

It was a wet morning in the first week of May 1924, that I received a call to see a Hindu elderly lady of 45 years up. Before I started I managed to gather from her relatives who came to me that she had been lingering from suspected Leucorrhœa for some 3 years, and was under a Homeo-man who, notwithstanding his best medicines, could do her no good. She would complain every now and then in spite of the best attentions of the attending Homeopath, of severe pinching, excruciating pain in her lower abdomen.

On my going there I found the poor lady prostrated on her bed, agonising and groaning heavily. On examination I felt a tumour-like lump in her right Illium; the Urine was milk-white with blood tinge, surcharged with jelly-like masses, and being microscopically tested gave out:— Chyle, Blood corpuscle, Calcium Oxalate and tube casts.

Questioning I learnt that she had no issue, not even an abortion, and had regular menses.

On the basis of urine report, I rejected the Leucorrhoeal theory remembering rightly and appositely an article in the Antiseptic Vol. XXI Feb. 1924 for which I am, indeed sincerely indebted, where I had the good fortune of going through a case of Chyluria caused by Round Worms, and suspected a like-case in my patient.

She had a slight Jaundice for which I hesitated to push on Santonine, the specific for Ascaris-Lumbricoides; and accordingly I advised the attendants to give her in the evening at least one ounce of the juice of fresh leaves of "Matkhula."

Piperazine, Lithia Citras etc., were also prescribed in order to dissolve the Urinary Calculus.

The next day 10 big Round Worms came out in 2 motions. The juice of the Matkhula leaves was continued once in the evening for 2 consecutive days. Some 30 or 40 Round Worms came out in a week. In a day or two the urine became a little yellowish. The treatment was kept on for a fortnight by which time the lower abdomen pain, the tumour-like swelling, agonies, in fine all complaints, subsided. The patient was relieved, her urine became normal and she came round radically.

Remarks:—"Matkhula" is a plant which grows abundantly in the plain of Bengal. The height of the plant generally varies from 2 to 4 feet, the stems of which are used for cleansing the teeth. It also bears small

rounded fruits. "Badadru" is its Sanskrit name while it is called by different names in different districts as Matkhura, As-shewra, Atkhula, etc.

The extracts of Matkhula leaves, I believe, cannot fail in the long run to exert a profound influence upon the intestinal worms.

"वदद्रु ञ्चास्य शाखीटः सपित्तकफ नाशनः ।

वातलञ्च क्रिमिंहन्ति पाण्डुताज्वर कामलाः ॥"

"इतिद्रव्यगुणम् ॥"

Generations ago, tbe Ayurveda speaks highly of its anthelmintic properties. Besides this there are other qualities of which we know little. It would be of much use if any research scholar who is interested in Indigenous drugs, be kind enough to inform us through the medium of your paper the result of his chemical analysis and investigations.

In conclusion I desire to express my thanks to Kaviraj Pran Ballav Dutt Kavi Bhusan for his kind assistance in consulting a few books.

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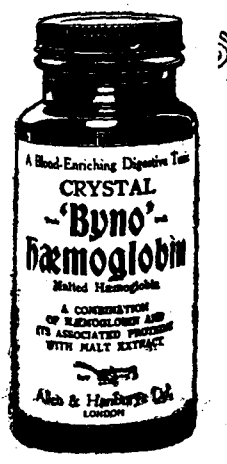


The Antiseptic

FEBRUARY, 1925.

THE LEPROSY PROBLEM.

Leprosy has of recent years come much into the limelight owing to frequent discussions about it and appeals for funds to combat it. The appeals issued lately by the Viceroy and the Prince of Wales on behalf of the Leprosy Relief Association in inaugurating a campaign in this country against Leprosy has set the ball in motion, and the lay public and the press of all shades of opinion have made it the subject of much comment.

Leprosy is one of the few diseases which have been known to exist from a very long time. It is world-wide. In India, however, it has assumed tremendous proportions. The last census gave the number as 102,513 but a lot more were not entered for reasons which we shall hereafter mention. A moderate estimate, however, gives the number of lepers as nearer one million than 500,000. This works out to their being one leper for every 300 or 400 persons in India. This indeed should be an eye-opener to every one. It is a problem worth tackling for our champions of public health.

Leprosy is essentially a skin disease. Its manifestations are so very disfiguring that it is a very common sight to see these poor sufferers exhibiting their ailments before temples and other places of festivities in India to evoke public sympathy and secure alms. By this means they earn their living. To go into a detailed account of the mode of onset and the clinical manifestation of the disease would surely be out of place here. The special methods of treatment with differential diagnosis can be obtained from any book on general medicine. The mode of infection and the general preventive methods are the more important matters to be considered from a public health point of view.

Leprosy is not a hereditary disease. That is to say it is not conveyed to the ovum. It is communicated from one leper to another. But the path of this conveyance is not definitely known, because of its long incubation period and also because the sufferer spreads the disease long before he himself is aware of his ailment. Another factor which greatly hindered research was the difficulty with which the *lepra bacillus* could be cultivated or inoculated. That climate had not the least influence on the disease was definitely proved by its prevalence in Iceland, Norway, Philippines—in fact, in the four corners of the world. It has also been found that Leprosy is not so common in the savage and the very highly educated classes. It is the middle classes that suffer most. Food has also been given the blame for conveying the infection. Fish, especially salted or stale fish, was said to be the greatest offender in this respect, but this theory has also been given up because many vegetarians have got the disease. It acts inasmuch as it lowers the general body resistance and predisposes to Leprosy—in fact to any disease. Whatever may be the cause, the one that seems most likely is the cutaneous inoculation theory. It is very probable, considering that the commonest sites of manifestation are the skin and the nasal mucous membranes, in addition to the nerves, that scratching of associated eczema and psoriasis or the irritation produced in the nose by worms may start the infection and help auto-inoculation. In India, however, there is extra scope for this method of man to man transmission. There being no proper isolation, infection takes place wholesale. Teachers or students infect one another; shopkeepers and merchants infect their customers; and servants infect their masters. Other fruitful sources of infection are the trains, trams, carriages, rickshaws, hotels and restaurants. The joint family and the purdah systems also help in disseminating the disease. The womenfolk crowd together in dark and dingy places and there is ample scope for personal contact and infection, apart from the lowered personal resistance due to want of air and light. The opportunities for spread of infection are therefore not few and far between.

However great may be our effort to cure the 'individual leper,' isolation of the patient must and will remain, as it has already done in the past, the most important factor in dealing with Leprosy. As the main mode of infection is not yet known it is very difficult to say how complete this isolation is necessary. With the present knowledge, limited though it be, the ultimate aim must be to secure as thorough and complete an isolation as possible. But as human nature shuns isolation, methods must be devised for not tiring the individual. This can only be done by the establishment of Leper Colonies. The mind, in all diseases, has a very great influence on the body. The interest, therefore, of the sufferers must be maintained by establishing in these asylums, schools, agricultural and dairy farms and other industries. All this requires money and it is for this purpose that appeals are made for funds. There are however great drawbacks and difficulties to be encountered with in this anti-leprosy campaign. Ignorance is the first great block. The poor sufferer does not really know the seriousness of the disease till a stage is reached when he would have infected a numerous lot. The diagnostic points too are so few and clinical manifestations so uncharacteristic that even the average medical man takes some time before diagnosing the disease. By this time much harm would have been done. Shame and prejudice are the next great impediments- "Once a leper always a leper" is the common saying. It is considered by most people as a scourge inflicted by God for the sinful. One would rather have malaria or cholera than Leprosy. The individual is so much shunned and despised that he tries to hide his affliction and is thus a prolific source of infection. Illiteracy and superstition also play a great part in the spread.

It is the duty of medical men to remove these prejudices and help in eradicating the disease. It is more their duty than anybody's else. Apart from being medical men we, as Indians, should lose no time in combating the scourge. There can, in our opinion, be no better opportunity than this for humanitarians and philanthrophists of all political and religious shades to contribute and co-operate for the purpose of carrying on the Anti-Leprosy Campaign. We hope and we feel sure that the appeals made by the Viceroy and the Prince of Wales will not fall flat on Indian ears.

A TIMELY REMINDER.

The statement issued by the Senate of the Calcutta University to allay any anxiety on the part of the public regarding the recent notification from the General Medical Council intimating the withdrawal of the recognition of the M. B. Degree of the Calcutta University, in pursuance of the threat hurled at that august body in its communication dated 8th June 1920 that "the Council will have to consider the continuance of the recognition of the Medical Degree" unless the University carried out certain measures to ensure satisfaction in the practical training in midwifery, is a fair and straightforward document which will go a great way not only in serving the purpose for which it is intended but also in teaching a lesson to the General Medical Council that India will not in future take insults lying down, and that in her anxiety for self-sufficiency she will care a brass farthing for the recognition of the Degree by the General Medical Council, except on reasonable terms. As in the case of the demand for Home Rule the leaders of the various political parties in England, wedded to more or less a policy of Imperialism, dictate certain impossible conditions which they consider should be fulfilled before India can aspire for it, so also the Medical Pundits of England propose to dictate to the Universities over here certain conditions for the recognition by them of their Degrees—conditions which, as the Professor of Midwifery, Carmichael Medical College, has rightly pointed out, have not been given effect to even in the Universities of their own country for several years past, in spite of similar threats hurled at them also. But as the British politicians conveniently forget that England did not wait for the attainment of self-rule till the conditions which they consider should be fulfilled as a necessary precedent to the establishment of Home Rule in India were fulfilled in their own country, so also the Medical Pundits of that country equally conveniently forget that the non-fulfilment of the conditions prescribed by them for the recognition of Medical Degrees which have now, according to them, justified the withdrawal of the recognition of the Degree, though not fulfilled by their own Universities, has not resulted in the same withdrawal of recognition of their own University Medical Degrees. This is only by the way.

Turning now to the definite issue before us, we need hardly say that while we admit that any student admitted to the M.B. Degree of any University should possess sufficient practical knowledge in midwifery to enable him to carry on his avocation most successfully, we refuse to admit at the same time that the practical training now given to the Medical students of the Calcutta University is in any way insufficient as to unfit them either for recognition by the General Medical Council, or for the successful carrying out of their everyday work, in the limited sphere which is open to them in this country, hedged as it is with a lot of social conditions and usages from which the West is fortunately or unfortunately free. The social customs of some communities in this country which adopt the purdah system do not allow of their women being treated by male doctors during their confinement, and yet the opportunities available to the Calcutta medical students for practical training are none the less for it, the country being inhabited by various sects many of which have no sentimental objections to the treatment whenever necessary of their womenfolk by male doctors during the confinement period. But the Senate of the Calcutta University does not rest content with a mere expression of this opinion. It is prepared, as its statement clearly indicates, to revise its medical curriculum; and this process should necessarily take sometime before it could be brought into force. But to expect that this University should be able to do in 4 years what the British institutions have not been able to accomplish in about 18 years, "since the finding of the Committee appointed in 1905 which after examining the answers received from 37 teaching institutions in Great Britain and Ireland came to the conclusion that the original rule was not complied with by the majority of the schools", is to expect the impossible.

The immediate reason which has induced the General Medical Council to adopt this repressive method, is the refusal by the Senate of the Calcutta University to allow the representative of the General Medical Council, Dr. Norman Walker, to inspect the Final M. B. Examination of the Calcutta University. This is just in keeping with the self-respect of the University, and the General Medical Council has only to blame itself for this rebuff, for, as the Senate rightly points out, "it took its stand on the fundamental principle namely that while recognition of a college for the purpose of affilia-

tion implied inspection, "recognition" of the "Degrees" conferred by one University or examining body can never mean inspection of colleges or of the examinations held under the auspices of the University." "For example," as they say, "under Section 7, chapter XVI of the Regulations of the Calcutta University, the University has power to admit to any University Examination any person who shall present a certificate from such institution as may be from time to time be recognised for the purpose of the Syndicate, showing that he has attended the course of study, passed examinations or taken Degrees equivalent to those which are required in the case of students of Calcutta University.

Taking the decision of the General Medical Council as a settled fact, the question arises whether the Degree granted by the Calcutta University will deteriorate in value. We believe strongly with the Senate that it will not, so long as it maintains its standard up to what prevails in all the Western countries. American Universities have not suffered a wit for the non-recognition by the British Pundits. In Italy, as a retaliatory measure, the privileges enjoyed at the present moment are being withdrawn from British practitioners. The principle of retaliation having been accepted by the Assembly in respect of some other matter, it should not be difficult for this country to extend its sphere to other matters also where the need may arise; and the application becomes all the more easy when we remember that the administration of the Medical Department is in the hands of popular ministers responsible to the legislatures. Even as regards appointments to the Provincial Medical Service, no difficulty need deter us for they are placed directly under the Minister of Public Health and because the registration of the Calcutta graduates in India "does not depend on the recognition of any University Degree by the General Medical Council but on the Indian Medical Degrees Act and on the Local Councils of Medical Registration. In these circumstances, unless the very reasonable demand of the Senate of the Calcutta University to continue to recognise its Medical Degrees until November 30, 1925, by which time the revised curriculum as suggested by the General Medical Council will have been adopted in the affilated Colleges and the necessary alterations made in the Regulations for the M. B.

Degree, it becomes the clear duty of the legislatures in this country not only to take such steps as may be necessary to supplement existing provisions so as to remove any doubts or misapprehensions, but also to resolve upon such course of action as will serve as a lesson to the General Council that it can no longer play with this country as it has done in the past; and in this sense we hope that the Senate's statement will serve as a timely reminder to our legislators.

CURRENT TOPICS.

OBSTETRICS AND GYNÆCOLOGY.

The Hour of Birth.—It is an almost universal belief among doctors and midwives that more infants are born by night than by day. Doubtless this belief depends to a large extent on a trick of the memory; we are much more likely to remember an event if it occurred in the night and robbed us of our sleep than if it occurred by day and was one of many thronging incidents following each other with kinematographic speed. To substitute facts for impressions, Dr. O. A. Boije of Helsingfors has recently carried out investigations at his Maternity Hospital, where he has found that the number of births between six in the morning and six in the evening was almost exactly the same as the number in the other 12 hours of the 24. His material consisted of 7,751 confinements, all of which were terminated spontaneously. There were 3,887 in the 12 hours of the day, between 6 A.M. and 6 P.M., and 3864 in the 12 hours of the night. The 24 hours were further subdivided into eight divisions, each of three hours, the divisions being from 6 to 9 in the morning, and so on. The graphic representation of the number of births in each of these eight divisions ran as an almost horizontal line, the difference between the greatest number of births (1,059 between 6 and 9 A.M.) and the smallest number (905 between 12 midday and 3 P.M.) being comparatively slight. It has often been taught by the text-books that the hours from midnight to 3 A.M. are those in which a greater number of births are crowded than in any other three-hour period. But in Dr. Boije's material there were only 1,018 in this three-hour period of the night. Turning to the hours at which the regular onset of labour begins most frequently, he finds much greater difference than in the case of the completion of labour. The 24 hours of the day being again classified in eight three-hour intervals, it was found that only in 6·5 per cent. of the total did regular labour pains begin between 12 midday and 3 P.M. From 3 P.M. there was a continuous rise for every three-hour period up to 3 A.M., the maximum being reached in the period 12 midnight to 3 A.M. As great a proportion

as 19·6 per cent. of all the labours began at this hour of the night. Almost twice as many labours began during the 12 hours of the night as during the 12 hours of the day, the actual figures being 5,084 and 2,658 respectively. It would seem that in Finland, at any rate, when labour begins at night, it is usual for a hasty departure to be made to a maternity hospital; whereas when labour begins during the day the departure for a maternity hospital is less precipitate. Consequently many more maternity cases enter hospital by night than by day.

It would seem that, though labour is as often terminated by day as by night, doctors and midwives are more likely to be called in by night than by day to attend confinements.

Radioscopy in Obstetrics.—M. N. Moss (Minnesota Med. Vol. 7 No. 9, p. 586) is an enthusaistic advocate of the use of X-rays in obstetrics, especially during the last month of pregnancy, in the case of all primiparous patients and also of multiparæ in whom some problem is present. By their use (1) the normality or otherwise of the relationship between the head and the pelvis can be determined, and thus large heads can be recognized and dealt with; (2) multiple pregnancy can be discovered; (3) the fœtal position and presentation can be ascertained; (4) a monstrosity may be diagnosed —a point of great importance in the after-treatment, since, if any difficulty is encountered at labour, perforation of the head will be performed in preference to a difficult forceps delivery, symphysiotomy, or Cæsarean section; (5) death of the child can be recognized by the detection of overlapping of the cranial bones which gives the head an irregular outline; (6) a certain diagnosis of pregnancy can be made in some obscure cases. He adds that X-rays used carefully are in no way harmful to the baby, and are especially useful in any case in which there is a prospect of difficult labour or Cæsarean section.

Treatment of Severe Dysmenorrhoea.—F. A. Cleland (Amer. Journ. of Obstet. and Gynæcol., September, 1924, p. 337) has found that in severe dysmenorrhoea the administration of ovarian, thyroid, pituitary, corpus luteum, and mammary extracts, alone or in combination, is no more effective than exhibition of iron, aloes, strychnine, and manganese,. In 230 cases of severe disabling dysmenorrhoea, in 117 of which the patients were unmarried, he has had good results from an operative treatment of which the essential step is the division of the muscular fibres at the level of the internal os, with the object of causing the nulliparous to resemble the parous uterus. One is apt to forget, he remarks, that essential dysmenorrhoea is always cured by childbirth. Dilatation to No. 10 or 11 (Hegar)

having been effected, two lateral incisions about 1/12 in to 1/16 in. are made with a blunt-pointed Bistoury in the internal os; dilatation is now continued to 14 or 15. To prevent subsequent contraction the uterus and cervix are firmly packed with iodoform gauze, which is left undisturbed for eight days. The strictest aseptic precautions are, of course, necessary. A slight rise of temperature usually occurs on the second day. Twenty-nine of the author's patients were only partially relieved, and eight were no better after this operation.

SURGERY.

Recovery from Spinal Fracture.—It is a curious fact that hitherto little information has been available as to the ultimate fate, as a class, of persons whose spines have been fractured. Dr. Augustus Thorndike, of the Surgical Division of the Maria Hospital in Stockholm, has recently attempted to fill this gap in our knowledge by seeking an answer to the question: What is the fate of these patients in terms of ability to work? At his hospital between the years 1914 and 1924 there were 47 cases of fracture of the spine; they were consecutive, unselected cases, in all of which the diagnosis was confirmed by X-ray examination, an operation, or a necropsy. Only in six cases were the fractures confined to the spinous processes. The bodies of the vertebræ were involved in the remaining 41 cases, 34 of which were unassociated with signs referable to the spinal cord. The fractures were cervical in 8 cases, dorsal in 18, lumber in 18, and sacral and coccygeal in 3. The most frequent site of fracture was from the ninth dorsal to the fourth lumber vertebra, and in as many as 16 cases two or more vertebrae were injured. The accidents were industrial in 57·7 per cent., and as great a proportion as 81 per cent of these industrial accidents concerned the building trade, dock and common labour. After discussing briefly the modern treatment of fractures of the spine, Dr. Thorndike gives an account of the issue in his series. Of the seven patients whose spinal cords were injured, five died, one remained in hospital, and one could not be traced. Of the 40 patients without spinal cord symptoms, three were still in hospital, three had died of causes other than the accident, and ten could not be traced. Of the 23 patients who were re-examined by the X rays, all were found to have recovered sufficiently to return to work—in most cases to fulltime work at their former occupation. The most important feature of this paper is its lesson that, given time and proper treatment, most fractures of the spine, provided the cord is not compressed, do not permanently incapacitate the patient who, if his occupation is clerical and not manual, may expect to return to his former

work without loss of efficiency. The manual worker may also hope to do so, but after a longer interval than the clerical worker requires. The average time lost by those of Dr. Thorndike's patients who recovered was 330 days—a period long enough to disable financially most workers for whom there is no accident insurance. Dr. Thorndike concludes with the hope that more statistics may be published on this subject so that comparisons can be made between his material and larger series of cases.

The Principles of Tonsillectomy.—The tonsil shares with the appendix the unenviable reputation of causing more trouble than it is worth in the economy of the body, for there is no evidence to show that tonsillectomy even in infancy destroys an important function from the lack of which a patient would suffer, while it is generally believed that enucleation lessens the liability to infectious diseases. Dr. A. Brown Kelly, in a discussion of the subject at the recent annual meeting of the British Medical Association at Bradford (Section of Laryngology and Otology), said that the two most common pathological conditions of the tonsils were sepsis and hypertrophy. The latter condition, he held, was most common in children, and there need be no hesitation in removing the tonsils and adenoids from a healthy child of 2 years or even 18 months. Tonsillar sepsis rather than hypertrophy was associated with adults, and, indeed, many tonsils which on inspection and on squeezing were apparently healthy, were on microscopical examination found to be diseased. The faucial tonsil is particularly adapted for the production of septic focci. The detection of a septic focus in a tonsil, Dr. Brown Kelly said, was a matter of great importance and sometimes of some difficulty, but the presence of caseous plugs in the crypts and enlarged cervical tonsillar glands was a valuable aid to diagnosis, although the absence of these signs did not preclude the presence of a small encapsuled abscess in the tonsil. He mentioned several points which had to be noted in advising operation in cases which suffered from systemic diseases known to be caused at times by septic tonsils: (1) if the focus was found, or if the patient was liable to attacks of tonsillitis and cervical adenitis, the tonsil should be removed and the patient told that the local condition would be cured, but that the improvement of the systemic disease could not be guaranteed; (2) if the onset of the tonsillar infection coincides with that of the systemic disease, the focus was probably in the tonsil; (3) if there were other septic focci—in the teeth, sinuses, or alimentary canal, these should be eliminated before advising tonsillectomy; (4) if the tonsil was clinically healthy, and there was no evidence pointing to a relationship between the tonsil and the systemic disease, enucleation of the tonsil should not be recommended. At the conclusion of the meeting resolutions were unanimously passed (1) that tonsillectomy by enucleation was the only effective operation; (2) that the operation should not be conducted as a minor operation, but as one of the lesser major class of operation; and (3) that the operation should only be undertaken after expert opinion had been given.

Diagnosis of Biliary Calculi.—P. Ligniac and A. Devois (Journ. de Radiol, et 'd Electrol., July, 1924, p. 307) state that French radiologists were surprised at the American statistics which showed 80 per cent of successes in skiagraphy of biliary calculi. The authors consider that the success of American radiologists is almost entirely due to the fact that while European patients are unwilling to allow more than fifteen to thirty minutes for radiographic examination, American patients do not hesitate to go into hospital for four to eight days for diagnostic purposes. During this period the radiologist has ample opportunity to examine the patient every day, as often as he likes, and in any position that he deems necessary; consequently as many as twenty to forty skiagrams may be taken. Since the adoption of American methods Ligniac and Devois are satisfied that without special preparation the multiplication of films will enable the great majority of biliary calculi to be demonstrated. The authors give skiagrams of three typical cases in married women in whom the suspected calculi were demonstrated only after a series of skiagrams had been taken. In their third case a deformity of the duodenum, diagnosed as due to peri-duodenitis, was shown to result from pressure by a large gall stone which had been invisible previously. They conclude that it is not only useful but also essential to take as many films and screenings as may be required for diagnosis.

Perforation of Gastric and Duodenal Ulcers.—If a gastric or duodenal ulcer has reached the stage when persistent medical treatment has failed to effect a cure, what are the chances of perforation occurring if operation is not resorted to? This is a question with which most physicians and surgeons are faced more than once, and it is unsatisfactory to note the great differences in the estimates of this risk by various authorities. Thus, Leube puts it at 1 per cent; Ewald at 1·2 per cent; Villingk at 2·7 per cent; Michaux at 3.5 per cent; Harslof at 10 per cent; Brinton at 1·3 per cent; Note at 25·8 per cent; and Krongious at 30·3 per cent. In a recent publication Dr. O. E. Cederberg has made a study of the cases of gastric and duodenal ulceration coming to operation for perforation at the Wiborg Hospital in Finland in the period 1904-24. In 11 of these cases the operation was performed before 1912, and inadequate records were

made on them. In the remaining 60 cases careful records were kept, and it was found that 22·9 per cent. of all the cases of gastric and duodenal ulcer coming to operation were complicated by perforation. Dr. Cederberg, after comparing his own findings with those of other surgeons, concludes that among hospital cases the frequency of perforation is about 10 per cent. With regard to his own material, he notes that only two of the patients were women, and only in ten cases was the perforating ulcer in the duodenum; in the remaining cases the pyloric portion and the minor curvature of the stomach were the sites of the perforation. During the food-restriction period of the war, 1917-1919, the frequency of perforations was almost twice as great as before and after this period, and it would, therefore, seem that war-time rationing played an important part in this matter. In 30 cases the operation consisted simply of closing the perforation and reinforcing the closure with Braun's omento-plasty followed by irrigation and drainage of the abdominal cavity. The mortality was 50 per cent. This poor achievement was largely due to the length of the interval in many cases between perforation and operation, but Dr. Cederberg thinks it was also due, in part, to faulty technique. Since 1914 gastro-enterostomy was often done as an adjunct to closure of the perforation, and of the 34 patients thus treated only six died. The later results, as well as the immediate post-operative results, seemed to be in favour of gastro-enterostomy, for 60 per cent of the patients thus treated were found at a later date to be in good health, whereas this could be claimed for only 30 per cent. of the patients treated only by closure of the perforation.

Nephrectomy in Bilateral Renal Tuberculosis.—A few years ago most surgeons would have refused to perform nephrectomy where both kidneys were tuberculous, perhaps they would do so even now. But a good case has recently been made out for removing the most diseased kidney, and the advocate of this course, Prof. G. Ekehorn, of Stockholm, speaks with an experience of about 200 cases of renal tuberculosis coming to operation. It is encouraging to find that renal tuberculosis is, on the whole, seen by the surgeon in an earlier stage than heretofore, and Prof. Ekehorn has observed an appreciable diminution during the last few years in the number of patients coming to him in an advanced stage of renal tuberculosis. But he has seen as many as 27 cases in which the disease was so advanced that he could not carry out all the usual tests, and in five cases not only was catheterisation of the ureters imposible, but he could not even examine the bladder by crystoscopy. The fate of such cases is usually expectant treatment. The course adopted by Prof. Ekehorn was more active; the kidney thought to be least damaged was

explored by an operation, and when not found to be too extensively damaged, the more diseased kidney on the other side was removed. In seven cases the operation was confined to exploratory exposure of the kidneys. In the remaining 20 cases the most diseased kidney was removed, the disease having completely, or almost completely, destroyed the kidney in 11 cases and having damaged it extensively in the remaining nine. The wounds on both sides were usually closed completely and without drainage, and though the operations were performed on the same occasion, the patients tolerated them satisfactorily, and in almost every case were better afterwards, as shown by diminution of the bladder symptoms and of the pus in the urine. Indeed, two of the patients were discharged as "well." These patients were operated on in Upsala and Stockholm between 1910 and 1922, and with a view to ascertaining their subsequent fate Prof. Ekehorn addressed inquiries to them in the autumn of 1922. He obtained no answer from five of the 20 on whom nephrectomy had been performed, and he found that ten other patients had died. One of them had lived for six years, another for two, and a third for a year and ten months after the operation. Five were still alive, and two of them were still able to do heavy work, although 12 years had elapsed since nephrectomy had been performed. They had to pass water more than once during the night, but they had no pain or other symptoms, and the urine contained no albumin. A third patient, operated on five years earlier, still had a trace of albumin in the urine and micturated frequently, but he had no pain and could work as before. It is on the strength of evidence such as this that Prof. Ekehorn favours nephrectomy in bilateral renal tuberculosis, when there is clear evidence that the most diseased kidney is largely responsible, for fever, pain, and other symptoms.

The Results of Conservative Treatment of Pott's Disease.—Now that the treatment of Pott's disease is becoming operative, and Albee's operation is extensively employed, it is most desirable that, for the purpose of comparison, information should be available as to the results obtained by more conservative measures. For it is obvious that there is no indication for operative treatment, however good its results, if patients recover as often, as soon, and as permanently under less heroic measures. To provide such material for comparison, Dr. Santeri Leskinen, of Hellingsfors, has collected the evidence obtainable in connexion with 241 cases of Pott's disease treated at his hospital on conservative lines in the period 1895-1920. As many as 21 of these patients died in hospital, and of the remaining 220, only 137 could be traced. There were 126 males to 115 females, and 68 per cent. were between the ages 1 and 10. The cervical vertebræ were involved in 16.2 per cent., the

The disease is slowly progressive, intractable to treatment, and is liable to occur in several members of a family. Its most typical ophthalmoscopic appearance is a passage forwards into the anterior layers of the retina of cells belonging to the hexoganal pigment layer which are normally situated at the back of the retina immediately in front of the choroid—this phenomenon first becoming evident in the mid-peripheral region. A constant symptom, even in early cases, is night-blindness; and the visual field nearly always shows a ring scotoma corresponding to the ring of abnormal pigment in the mid peripheral zone. Two antagonistic theories have been and are still held to account for these phenomena. On the one hand, the atrophy of the outer layers of the retina is supposed to be secondary to changes of a sclerosing character in the choriodal blood-vessels on which their nutrition depends. On the other hand, it is suggested that the degeneration of the retinal elements is primary and the sclerosis of the vessels of the choroid a secondary phenomenon. Creacher Collins put the case for this view five years ago in an important paper which was much criticised at the time, but which has never been satisfactorily answered. In his view these cases are analogous to those degenerations of tissue due to defective vitality to which the late Sir William Gowers gave the name "abiotrophy". These diseases present characteristic features, says Collins, wherever they occur, which differentiate them as a class from other affections, These features may be summarised as follows: 1. The tissue which is affected is one that has attained mature development and which then retrogresses. 2. The condition is one which commonly involves several individuals of the same family, either members of the same childship or members of different generations. 3. The parts affected are usually bilateral and the extent of disease is limited by definite anatomical landmarks (as, for instance in the nervous system by a certain set of neurons). 4. The changes produced are progressive so far as the anatomical limits of the tissue permit, and recovery does not take place. 5. The tissues involved are those which have attained a high degree in specialisation. In all these respects a typical case of retinitis pigmentosa appears to conform. Physiologically the pigment in the hexagonal pigment cells is possessed of the power of amœboid movement which is exercised under the stimulous of light. In the normal retina, however, a barrier is formed by the external limiting membrane through which the pigment cannot pass. Atrophy of the rods and cones causes openings in this membrane through which the pigment is free to wander. According to this view, the sclerosis of the chorio-capillaries which is so often found is not the primary affection but is secondary to the retinal atrophy, and Collins supports his argument by citing the fact that the pathological examination of the eyes from our undoubted cases of retinitis

thoracic vertebræ in 56·4 per cent., and the lumbar vertebræ in 27·4 per cent. Thus, the thoracic vertebræ were involved in more than half the total number of cases. But when the incidence of the disease in each vertebra was calculated, it was found that it was highest for the lumbar vertebrae, each of which accounted for 13·2 per cent., of all the cases, whereas the corresponding figures for each thoracic and cervical vertebra were 11·3 per cent., and 5·5 per cent. respectively. In addition to the 21 patients dying in hospital, there were 43 who died after discharge. Thus, the mortality among the patients who could be traced was as high as 40·5 per cent. It was much higher for males than for females, the respective figures being 50 per cent and 32 per cent. Tuberculosis or its sequels was the cause of 57 of the 64 deaths. The survivors who were traced were classified according as they were still ill, fairly well, or cured. The figures for these three classes were, in the order named 12, 17·1 and 30·4 per cent respectively. It will thus be seen that with a mortality of 40·5 per cent., and a complete recovery rate of only 30·4 per cent., there was much room for improvement on the results of conservative treatment. The best results were obtained in disease of the cervical vertebrae, only 26·3 per cent. of the patients having died, whereas 68·5 per cent had completely recovered. Disease of the thoracic vertebra responded least satisfactorily, the mortality being 46·3 per cent and the recovery rate 21·1 per cent in this class. When the patients were classified according to their ages, it was found that the mortality was highest in the first two decades, in which it was 41 and 44·3 per cent respectively. It was lowest in the third decade, in which it was 30·8 per cent. After the age of 40 the mortality became higher again. The average duration of treatment in hospital was eight months for the patients who were cured, six and a half months for the patients who remained fairly well, and seven and a half months for those who remained ill. It is sincerely to be hoped that operative treatment may give better results.

OPHTHALMOLOGY.

The Treatment of Glaucoma.—Glaucoma has given rise to more controversy than almost any other subject in the range of ophthalmology. A new treatment is reported by our Berlin correspondent, who refers to a paper read by Dr. Carl Hamburger before the Berlin Medical Society, advocating the sub-conjunctival injection of suprarenin. The effect produced, he says, is an enlargement of the pupil and decrease of pressure, while the choroidea becomes anæmic through blocking of the small arteries. The amount injected at one time is ½ c.cm., and the dose has to

be repeated as soon as the symptoms recur. By this method he claims to have treated several patients with success. A method of counteracting increased intra-ocular tension by diminishing the quantity of blood entering the eye runs counter to all that has hitherto been taught on the subject. The dilatation of the pupil in itself is a contra-indication, and to cause retinal anæmia would hardly seem to be the best way to combat a disease in which retinal function is gravely impaired. Moreover, any good effect of a drug like suprarenin is bound to be only temporary. The aim of all rational treatment has hitherto been not to prevent the entry of fluid into the eye, but to facilitate its exit. In the normal eye the main channel of exit is Schlemm's canal, to which access is given through the trabecular tissue that occupies the angle of the anterior chamber. When this is made shallow by pressure from behind, due to increased intra-ocular tension, access is difficult, and when the pupil is dilated the angle is made still smaller and the difficulty increased. Hence, the traditional treatment of glaucoma-non-operative by eserin, which contracts the pupil, the operative by iridectomy, which provides an artificial anterior chamber. Often, however, these measures are insufficient, and the modern operations—Elliot's Lagrarge's, Herberts—aim at providingan alternative exit for the intra-ocular fluid through the sclera. If there is one lesson which modern experience with regard to the treatment of glaucoma has taught, it is the danger of temporising too long. We should therefore hesitate to encourage the trial of any new experimental treatment without convincing reasons in its favour.

Radium Treatment of Cataract.—McKee and Swett (Amer. Journ. Ophthalmol., August, 1924, p. 587) report upon a series of 25 cases of incipient cataract which were treated by radium. A dose of 10 mg. hours was applied twice a week for eight treatments, the same dosage was then applied once a week for eight treatments, and subsequently every two weeks. Their conclusions are that in no case was any definite permanent improvement obtained. Some of the patients said they were better shortly after the treatment, but such improvement probably depended upon psychological causes, as no alteration such as absorption of the opacities was seen. The application of the radium caused no apparent injury to any of the structures of the eye apart from an occasional slight erythema of the lids.

Retinitis Pigmentosa.—Retinitis pigmentosa is one of those diseases, the pathology of which is still a subject of keen debate. To recapitulate the main facts which any theory, to be tenable, has to explain

pigmentosa in different stages of the disease by independent observers, has shown that it may occur without any discoverable scelerosis of the choroidal vessels.

With regard to the particular region of the retina first affected in typical cases, the advocates of the choroidal theory connect the ring scotoma and the distribution to the pigment in the periphery with the anatomy of the ciliary arteries, the disease commencing at a part where the supply of choroidal blood is least efficient. Collins finds the evidence for this view insufficient and prefers to connect the distribution of abnormal pigment and scotomata with the fact that different regions of the retina are developed at different periods of fœtal life. "It appears that the neuro-epithelium of the ultimate central area of the human retina is of later formation than that of the parts around and that of the part immediately around the central area is the first to attain its full development." It is this paracentral area that is affected first in typical cases of retinitis pigmentosa, whereas the central area which is the last to be developed is usually the last to be involved. In the interval since this theory of "abiotrophy" applied to retinitis pigmentosa was first put forward, we have had but little fresh light on the problem. Mr. M. L. Hepburn, in an article in the September issue of the British Journal of OPHTHALMOLOGY, supports the choroidal origin of the disease, and pertinently remarks in connexion with Collin's paper that he cannot quite follow the argument that perfectly healthy pigment and pigment epithelial cells should wander away from their normal position, merely because their anatomical boundaries in front are destroyed. The subject is complicated by the fact that there are certain cases of undoubted choroiditis in which the signs and symptoms are very similar to those of typical retinitis pigmentosa. Occasionally, it is very difficult to make the distinction between the two. If the supporters of the choroidal theory are right, there is no distinction in kind but only in degree. On the other hand, if the theory of "abiotrophy" is ultimately confirmed, the resemblance is accidental.

MEDICINE.

The Action of Digitalis.—H. Vaquez (Arch. Mal. Du Coeur, Des Vaisseaux et Du Sang, October, 1924, p. 609) reviews modern theories of the action of digitalis, the indications for its use, and the method of prescribing it. He remarks that the collection of digitalis leaves is particularly unsatisfactory; many specimens of the drug are almost inert owing to improper methods of collecting and drying the leaves, which contain oxydases capable of producing profound chemical changes in the glucosides should fermentation occur. He finds "digitaline cristalisee (Nativelle, 1868), still the most reliable preparation. Vaquez advances several objections to standardization of the infusion and tincture by animal experiment, and asserts that advances in our knowledge of the action of digitalis have been due to clinical observation rather than to physiology. He maintains that Lauder Brunton's description of the phases of the action of large doses of digitalis still holds good, except that he was in error in stating that the drug is diuretic even in health. Vaquez points out that digitalis acts directly on the myocardium, and when this is damaged digitalis may

interfere with the tranmission of the impulse from auricle to ventricle, causing pulses bigeminus and extra-systoles by increasing the muscular irritability. When this is very marked it may indicate disease of the myocardium or of the bundle of His and necessitate a grave prognosis. Vaquez objects to the term "cardiac tonic" as applied to digitalis, and observes that Harris has described, three phases in its action: (1) Diastole and systole are both prolonged, without augmentation of systolic contraction or of the volume of blood. The heart is "slowed" probably as a result of action on the sinus; this is of small value in relieving the circulation. (2) Systole becomes slower and more forcible, the quantity of blood poured into the aorta is increased, and the intraventricular pressure rises. At that movement disturbance of conduction may be observed. (3) The heart beats are accelerated, the quantity of blood is diminished, and intraventricular pressure falls; this is the toxic phase. Study of electro-cardiograms has thrown light on the action of digitalis but the ultimate proof is clinical. The promiscuous prescription of digitalis for every form of cardiac arrhythmia, whether organic or purely functional, is unjustifiable. Vaquez insists that digitalis is of little value in mitral regurgitation until cardiac dilatation is so advanced that there is definite oedema. Similarly in aortic regurgitation digitalis in not indicated until arrhythmia occurs with symptoms of secondary dilatation. He holds that the fear that digitalis will raise the blood pressure in these cases is illusory, and may be very prejudicial to the patient's welfare. The drug should not be withheld in the belief that it has produced or increased bigeminism or arryhthmia; on the contrary, as the drug acts it is usual for the rhythm to be restored. Permanent bradycardia definitely contra-indicates digitalis. Vaquez considers that the use of small doses of digitalis is forbidden by logic and experience, and that the dangers of its cumulative effect have been exaggerated. He cites the case of a man suffering from high blood pressure with cardio-renal derangement and generalized œdema who had had 5 drops of digitaline solution daily for a long period without improvement. The drug was withheld for ten days; the patient then recieved 40 drops in one dose, followed by 10 drops on each of the next two days. After forty-eight hours there was abundant diuresis; in a week he passed 740 ounces of urine and the œdema disappeared.

An Infection with all the Three Malarial Parasites.—Malarial infections vary greatly in their amenability to treatment by quinine, although opportunity seldom arises to prove this in the history of a single case. Hence the particular interest of a report by Dr. Kadri Mahamed, a medical officer in the Turkish Army in Asia Minor, on a patient in Cilicia, who complained of pain in the abdomen, diarrhœa, and daily attacks of fever, with a long history of malaria. When his blood was examined next day a severe infection with both benign tertian and quartan was found, and a slighter infection with subtertian crescents. Two days later he was put on quinine, 15 grs. daily, in four divided doses. Eighty hours later, after the patient had taken 52 grs. in all, no benign parasites at all were observed, but only deformed quartan parasites and crescents. The patient was put on 15 grs. daily for seven days, thereafter on half doses, and after three weeks' treatment only crescents and very few of them were to be seen; the

diarrhœa had ceased, and the spleen had become normal in size. The after-history of this case should be interesting, for although in the early stages of infection the benign tertian parasite is the form most easily dealt with by quinine, the successful treatment of a relapsing case is one of the most difficult problems in malaria; relapses are apt to continue in spite of the use of quinine in full doses. Dr. Mahommed's patient was fortunate if the check to infection was lasting.

Lesieur's Sign in Typhoid Fever.—J. Chalier (Progress Med. 15th October, 1924, p. 619) states that in 1908 Lesieur, in the thesis of his pupil Colliguon, drew attention to the frequency in typhoid fever of impaired resonance at the right base, especially on percussion posteriorly and in the axilla. He attributed the phenomenon to hepatic enlargement or to pushing back of the liver by the distended colon. In a subsequent paper, published in 1913 (Press Medicine, 30th July) he furnished statistics of 150 cases in which he had investigated the sign. His observations as to the frequency of the sign in typhoid fever were confirmed by the Roumanian clinicians Kadulesco and Atanassiu. The sign is investigated as follows: The patient is placed in a sitting position with the trunk slightly bent forwards and the shoulders dropped. The right base is then percussed in a transverse direction between the vertebral column and the posterior axillary line and vertically between the apex of the scapula and the lower ribs. A rectangular zone is thus marked out in which impairment of resonance can easily be detected. The sign appears early and persists throughout the height of the disease. Lesieur found it present in 80 per cent. and Mourquand in 70 per cent. of their typhoid cases. In Chalier's series of 85 cases it was found in 65, or 77 per cent., so that it was almost as frequent as enlargement of the spleen, which was present in 85 per cent., and much more frequent than rose spots, which were present in only 60 (65 per cent), and palatal ulcers, which were found in only one-fifth to one-sixth of all the cases. The sign is also of some prognostic value, as it is more likely to be absent in mild than in severe cases.

Theobromin Sodium Salicylate (Diuretin) in Hydrocephalus.—Observing the effect of Diuretin on oedema, W. McKim Marriott (Amer. Journ. Dis. of Children, October, 1924, p. 497) deduced that an analogous absorption of cerebro-spinal fluid from the subrachnoid spaces into the blood would take place. He therefore treated six hydrocephalic infants with diuretin (up to 0·2 gram t.d.s.) and obtained excellent results in the communicating type of hydrocephalus. No benefit was obtained in two cases with complete obstruction of the ventricle. No ill-effects were observed other than a temporary condition resembling sclerema in one case. Marriott urges that this treatment be given a trial before recourse to the more dangerous surgical procedures.

X-Ray Treatment of Whooping-Cough.—H. I. Bowditch, R.D. Leonard, and L. W. Smith (Amer. Journ. Dis. of Children, September, 1924, p. 323) claim that Roentgen rays in the treatment of whooping-cough give better results than any other method of treatment. Twenty uncompli-

cated cases of whooping-cough, 18 of which were in children under 3, were treated. A rapid reduction in the number and severity of the paroxysms followed, and, parallel with this, a fall in the lymphocytosis occurred, replacing the usual maximum in the third week. B. pertussis was recovered from 30 per cent. of the cases which were in or under the third week of disease: cultures from older cases were sterile. Three cases complicated by pneumonia were similarly treated by Roentgen rays, and the same relief from paroxysms followed, thus conserving the babies' strength. In these cases the rays were successfully combined with treatment by diathermy, as advocated by Klensmidt in Germany.

Herz's Sign.—C. Curupi (Cuore e Circolazione, September, 1924, p. 353) has tested the value of Herz's sign for cardiac insufficiency in 50 cases. As regards the technique the subjects were always kept in the supine position for at least ten minutes before the experiment, so as to exclude the influence that repeated change of position might have on the number of cardiac pulsations: the movement of the arm was then carried out slowly so as to reduce the muscular work as far as possible. In 20 more or less neurasthenic individuals the results were negative: not only was there no diminution, but there was not even an increase in the number of pulsations although the experiment was repeated. The sign was also absent in 10 other cases, 5 of which showed a dimunition in the number of cardiac pulsations ranging from 1 to 9, and 5 a dimunition of only 2 or 3. In the remaining 13 cases there was a dimunition of more than 5 beats (6 to 19). The sign was negative in cases of obvious myocardial change, while it was present in cases without any appreciable affection of the myocardium. Curupi comes to the conclusion that Herz's sign is neither characteristic nor constant in myocardiac degeneration, and therefore possesses little clinical value.

The Therapeutic Use of Oleum Chenopodii.—W. Straub (Klin. Woch., October 28th, 1924, p. 1993) reports a case of poisoning from oleum chenopodii given three times a day in the usual doses. Severe enteritis followed and death occurred in a few days. Four other cases of a similar nature are mentioned. Oleum chenopodii is a valuable drug in the treatment of affections due to ankylostoma (hook-worm). The secret of its satisfactory use lies in preventing absorption. Straub thinks that the fatal results were probably due to the drug being given three times a day. He states that it is important that the drug should be given in one sufficiently large dose, and that then it should be expelled from the intestines by an aperient. If a satisfactory result is not obtained by this dose, an interval should elapse before the treatment is repeated. The method used in Central America (W. E. Deeks) is quoted. The evening before the treatment the intestines are cleared by magnesium sulphate: next morning at 7 o'clock twenty-four drops of oleum chenopodii in a gelatine capsule are given on an empty stomach. This is stated as the dose for an adult, and the capsule should have been recently filled. Two hours later a similar dose of the aperient is given, and the treatment is then complete. The second aperient is given in order that the oleum chenopodii may not remain longer in the intestine than is absolutely necessary. Repetition of the treatment, if required, should only be undertaken after two weeks. In no case should a second treatment immediately follow the first, as otherwise toxic symptoms may be expected. Straub concludes that by taking these precautions oleum chenopodii may be used without risk.

BOOK REVIEWS.

EPIDEMIC ENCEPHALITIS.

By Arthur J Hall, M.A., M.D., F.R.C.P., 17 plates and other illustrations. Price 12 net, 229 pages, John Wright & Sons Ltd., Bristol.

The book mainly forms the 'Lumlian Lectures' delivered before the Royal College of Physicians of London in 1923 by the author. A section on Treatment has been added. The book deals the subject under the following headings viz:—Epidemiology, morbid histology, bacteriology and experimental pathology, clinical manifestations, later manifestations, differential diagnosis, prognosis and treatment. The subject is thoroughly dealt with and we recommend the book to every practitioner.

CANCER: HOW IT IS CAUSED: HOW IT CAN BE PREVENTED.

By J. Elles Barker, with an introduction by Sir W. Arbuthnot Lane, Bart, C.B. M, S', F.R.C,S. etc., Consulting Surgeon at Guy's Hospital London. Published by John Murray, Albemarb St, W. London. Pages 432, price 7 net.

As the author himself puts it, it is really very daring for an outsider to write a book on a highly technical, much discussed and obscure subject, such as the causation and prevention of cancer. It is doubly daring for one who is not a medical man to criticise and try to disprove the views which are very generally held among professionals, and to put forward a doctrine of his own. In his own way, the author has described the causation and prevention of cancer. In this book he has discussed most of the views existing and has put forward his own theories, supporting them by an enormous number of facts. The book is written in the plainest and the most untechnical language so as to make it understandable to the general public. Surely the book will prove of great interest to the general public as well as to medical men. It is a veritable store house of information and it will open new vistas to the medical profession.

ACUTE INFECTIOUS DISEASES: A HANDBOOK FOR PRACTITIONERS AND STUDENTS.

By J. D. Rolleston, M A.,M.D. (Oxon) Senior Asst. Medical Officer, Grove Fever Hospital, London; Editor of British Journal of Children's Diseases, etc., Published by William Heinemann Ltd., London. Pages 376, price 12 6 net.

J. D. Rolleston's handbook of acute infectious diseases presents the subject to the medical profession in a very concise and well-analysed form. All the rare conditions are omitted. Only those diseases which are mainly or exclusively treated in the Isolation Hospitals are discussed. The work is chiefly clinical in character and is based upon an experience of about twenty-five years and a study of a large amount of literature. Each chapter deals

with the definition, historical note, aetiology, Bacteriology, morbid anatomy, signs and symptoms, complications, diagnosis, prognosis, prophylaxis and treatment of the disease. The author has taken great pains to discuss the subjects with reference to the age, sex and climate as well as of the different systems in the body. The book will be of great help to the practitioners as well as to the students.

HANDBOOK OF SURGERY.

By G. L. Chiene, M.B. C.M., F.R.C.S. (Ed), Surgeon. Edinburgh Royal Infirmary, Lecturer and Examiner in Surgery, Edinburgh University &c &c, &c. 1923 592 pages illustrated E. S. Livingstone, Edinburgh. Price Sh. 12/6

This handbook is intended for those who have not time to study the larger text books. The author emphasises the more common and important surgical conditions met with. This work is not intended to compete with the larger works on Surgery. All anatomical, bacteriological and pathological details, frequently found in larger text books have been omitted Detailed descriptions of operative treatment are also omitted. Readers are referred to bigger works. On the whole the book deals with the subject in a concise way. It is sure to be useful to revise the subject for the students just before appearing for any examination. For practitioners it is also of immense use to refresh their memory. Illustrations are splendid and enhance the value of the book. We commend the book to our readers.

ON THE BREAST.

By Duncan C. L. Fitz Williams C.M.G., M.D., F.R.C.S. 439 pages, Illustrated 30 net price W.M. Heinemann Medical Books Ltd., 20 Bedford Street, London W.C.

Of all the organs the breast is perhaps the one that is most neglected in treatises on general surgery. Not only is the space given to it inadequate but also the classification of its diseases inaccurate. To remedy this defect the learned author has brought out this useful work on 'Breast.' The subject is dealt with in detail in the book. The following are some of the most important headings under which the subject is treated:—viz., Development and anatomy of the breast; abnormalities of the breast; abscess of Lactation; tubercle and syphilis of the breast, Sarcoma of the breast; carcinoma of the breast; malignant diseases of the breast; Paget's disease and X-ray treatment of malignant diseases of the breast. The author gives a fund of information gathered from his own experience and also from the literature available on the subject. The book is fit to be in every medical library in this country.

RHUS DERMATITIS (POISON):—ITS PATHOLOGY AND CHEMO-THERAPY

By James B. McNair. 298 Pages Price, S. 1-75. The University of Chicago Press, Chicago.

Of all cutaneous eruptions caused accidentally by plant substances, that resulting from poison oak or Ivy is the most common in North America. The author in this book takes up a differentiation of poisons, oak poison, Ivy etc. giving geographical distribution, common occurrence and giving a complete investigation from the standpoint of pharmacology of botany and of chemistry. A.

lack of a rational treatment has led the author into a protracted study of poisons and the isolated principles to get the characteristic properties so that a basis of treatment might be arrived at. But of this he evolves two tentative treatments, which we commend to the readers.

CONDENSED DIFFERENTIAL DIAGNOSTICS AND URINE EXAMINATIONS.

By Gurdit Singh, L.M.F. Pages 141-1924. Khosla Printing Works, Lahore.

This is a handbook of Urine examinations including analysis, findings, and indications, intended for medical students and junior practitioners. The author has given in a very clear tabular form the main groups of the diseases which closely resemble each other with their important diagnostic features This book is very useful for students to revise their knowledge just before the examinations.

THE HUMAN TESTIS AND ITS DISEASES.

By Max Thorne M. D. 308 Illustrations. 548 Pages. T. B. Lippincott Company at the Washington Press. Price S. 8·00. Philadelphia and London.

This is a compact work that embraces and elucidates the important questions pertaining to the anatomy, functions, pathology, dystrophies, endocrinology, aberrations and other important questions concerning human testes. This volume is a presentation of the views of the author as to endocrinology and of the testis which are based on experiment and research rather than on a surgical manual. One cannot read the book without coming to the conclusion that there is a definite field for sex gland transplantation In this part of the world we have had considerable experience of using testicular extract as means of improving sexual power. So theoretically we are convinced that the operation of testicular transplantation must be a complete success We shall wait for further reports. Illustrations are very good. The book is extremely interesting andwell-printed. We commend the book to our readers.

THE THEORY OF DECREMENTLESS CONDUCTION IN NARCOTISED REGION OF NERVE

By Genichi Kato, Prof. of Physiology, Director of Physiological Institute, Keio University, Tokyo. Illustrated 53 diagrams and vi plates, Pages—166 Published by Bookseller Naukodo, 32, Harukichosanchome, Hongoku, Tokyo, Japan.

This interesting mongraph of Dr. Genichi Kato deals with the three fundamental properties of the fresh nerve (applicability of "all or none" law, decrementless conduction of intensity and velocity) and how would they be influenced by certain artificial modificatios such as narcosis or asphyxia. Many experiments are described to show the influence of the length of narcotised nerve on the depth of narcosis required to abolish conduction, change of the height of muscle contraction tested at outside electrodes, narcotising the different lengths of nerves; the negative variation at two points in narcotised tract of nerve; excitability of nerve within the narcotising chamber during narcosis etc. The validity of the theory of Decrementless conduction in the asphyxiated nerve, the sensory nerve and motor nerve has been well discussed with experimental basis. Finally the author comes to a conclusion that the nervous impulse does suffer decrement neither in its intensity nor in its velocity during the passage along narcotised region of nerve and that the "all or none law" is valid for the narcotised region of nerve. We commend this book to our readers.

BOOKS RECEIVED.

The following books have been received and the courtesy of the Publishers in sending them is acknowledged. Reviews will be published from time to time. [ED. ANTISEPTIC].

The Manager of the Antiseptic will be pleased to supply the readers any books acknowledged hereunder, or others at the Publisher's price. When sending their order the readers are requested to send a remittance for the full value of the book. That a remittance in advance should be requested is no reflection on the credit of any reader of the Antiseptic; but is simply a condition necessitated by circumstances.

Annual Report of the Union Mission Tuberculosis Sanatorium.—Arogyavaram, South India.

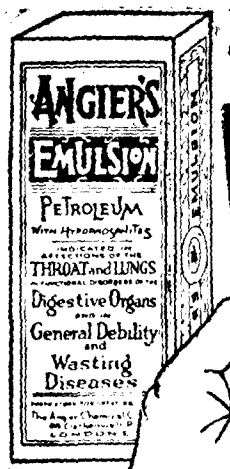
Mind and Medicine.—By Thomas W. Salmon, M.D., Professor of Psychiatry in Columbia University. Published by the Columbia University Press, 2960, Broadway, New York City.—Price 8. 1-00 or Rs. 4, postage 5 annas, pages 33.

Reminiscences of an old Physician.—By Robert Bell, M.D., F. R. F. P. S., with illustrations. Published by Mr. John Murray, Albemarle St., W. London.—Price 8. 16 or Rs. 14-0-0, postage 14 annas, pages 291.

Auto-Suggestion for Mothers.—By Mr. R. C. Waters, Lecturer in English to the Nancy School.—Published by Messrs. George Allan and Unwin Ltd., Ruskin House, 40, Museum St., W. C. 1, London.—Price 3s. 6d. or Rs. 3-1-0, postage 5 annas, pages 94.

Psycho-Analysis and Everyman.—By Dr. D. N Barbour. Published by Messrs. George Allan and Unwin Ltd., Ruskin House, 40, Museum St., W. C. 1, London.—Price 6s. or Rs. 5 4-0, postage annas 8, pages 191.

Physiological Incompatabilities in Dental Surgery.—By U. Reinuke, L.D.S. (Edn.)—Published by the Record Publishing Co., P. O. Box 643, Cape Town. Price 10s 6d or Rs. 9-3-0. —Postage 5 annas, pages 137.



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