THE ANTISEPTIC

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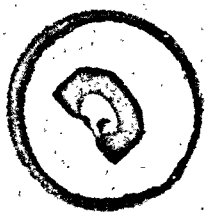

JULY, 1939 Vol. XXXVI. No. 7.

The Antiseptic

A Monthly Medical Journal

Edited by

Dr. U. Rama Rau, M.L.C. & U. Krishna Rau, M.B., B.S.

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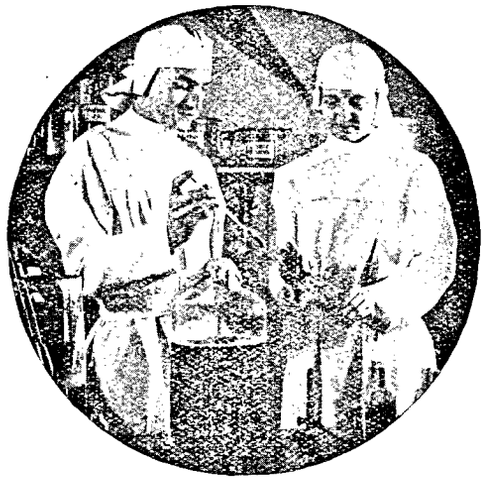

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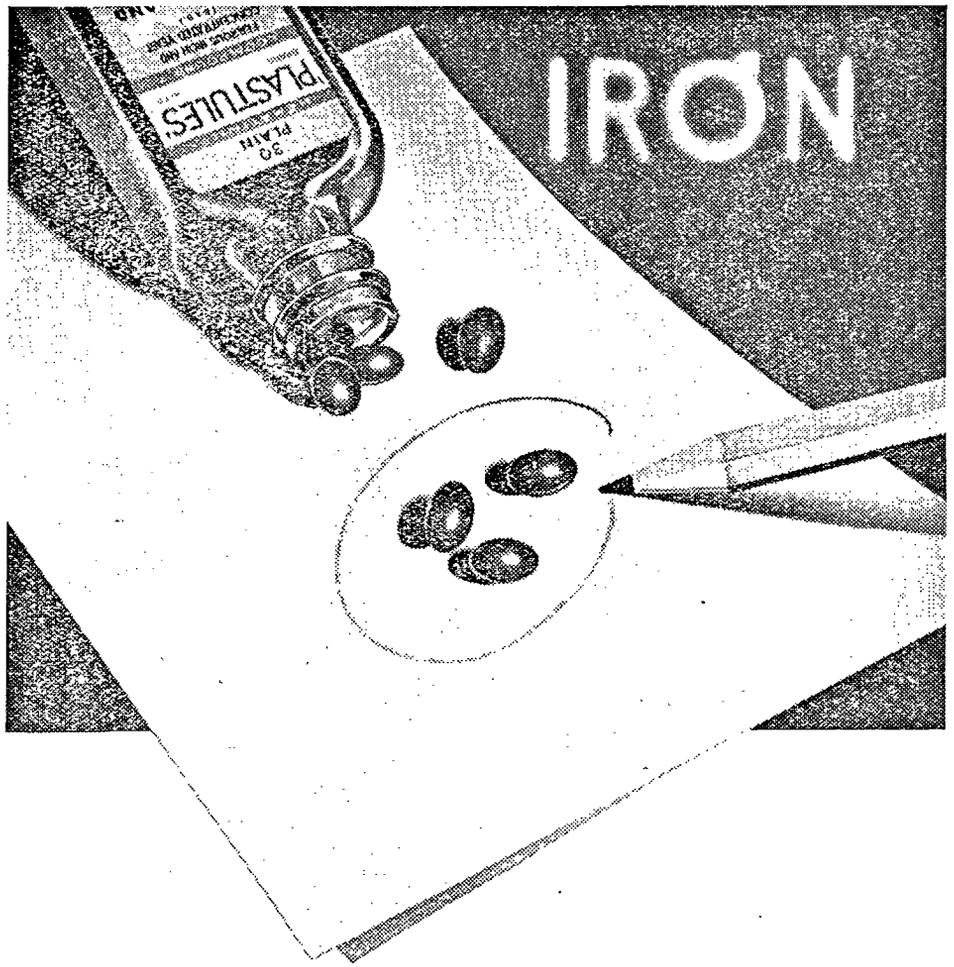

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ORIGINAL ARTICLES

The Treatment of Staphylococcal Infections*

BY

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THE views on the specific treatment of staphylococcal infections have undergone considerable change since Parker established in 1924 that the pathogenic strains of staphylococcus produce a soluble toxin. The lesions caused by this organism had been regarded previous to her work as due to the poisonous effect of the bacterial multiplication and lysis that took place at the focus of infection. But recent studies have proved beyond doubt that the pathogenic staphylococcus under suitable conditions of growth elaborates toxic substances resembling in every respect the classical bacterial toxins and that these soluble toxins play a very important role in the pathogenesis of staphylococcal lesions. Investigations are also making it more and more clear that, while the immunity in staphylococcal infection is both antibacterial and antitoxic, the latter is probably more important than the former. Thus there are two sets of factors concerned in the pathogenesis of staphylococcal infections, the dead and

* Specially contributed to "The Antiseptic".

disintegrated bacterial body and the soluble toxic products and any specific treatment must be directed against both these.

The importance of staphylococcal infections is not so much in their causing danger to life as in their troublesome nature from a tendency to chronicity and to recur over long periods and also in their paving the way for or complicating other infections making it difficult to eradicate the latter. All members of the genus Staphylococcus are not pathogenic and only the pathogenic ones are known to produce soluble toxins. The great majority of strains of the aureus type and a few of the albus type are toxigenic. The white variant of the Staph. aureus is also often highly toxigenic. All the rest are non-pathogenic and non-toxigenic. Hence, whenever a gram positive coccus is isolated from a lesion, specific treatment is not indicated unless it be a pathogenic strain.

The reorientation of ideas about the pathogenesis of staphylococcal infections find practical expression in the field of treatment. Since Wright introduced the vaccine therapy more than a quarter of a century ago extensive trials have been given to it but in the light of recent knowledge it is not surprising that the results of vaccine treatment have not been uniformly good. Recognizing that antitoxic immunity in staphylococcal infection is at least as important as antibacterial immunity, the more rational method of active immunization is being exploited with great assiduity. As in the case of the classical toxins a toxoid degeneration can be effected by suitable treatment of the soluble toxins of the staphylococcus and the product so obtained is atoxic but antigenic and capable of combining with the specific antibody. This product, the toxoid, may soon replace the heat-killed vaccine. Whether the "vaccoid", a combined product of toxoid and vaccine, has greater immunizing properties than toxoid, is also under investigation. Smith (1936) has prepared a toxin-antitoxin floccule which is shown to be effectively antigenic. The specific treatment can be resolved into three parts:- the vaccine treatment, the toxoid treatment and the serum treatment. Many workers claim to have successfully treated staphylococcal infections with prontosil derivatives such as uleron. But it has not yet emerged out of the experimental stage and to claim for these any specific antistaphylococcal properties is premature. Chemotherapy, however successful, is not an effective substitute for active immunization and the latter is bound to have an abiding place in the treatment and prevention of bacterial infections.

The Vaccine Treatment.—It was in connection with the staphylococcal infections that Sir A. Wright first used vaccine as a therapeutic agent for the treatment of bacterial infections and since then it has become one of the routine methods in the treatment of such infections. Usually a heat-killed vaccine is the one used. An autovaccine is much more efficient than a stock vaccine. We have been using a carbolized vaccine for the last ten years not using more than the ordinary incubator temperature at any stage of its preparation. Twenty-four hour old growth on agar slope is suspended in 0.5% carbolic acid in normal saline and the suspension is standardized with Brown's opacity tubes. This is incubated for twenty-four hours and tested for sterility by appropriate methods. Ascending doses from 200 millions to 1000 millions are tubed in 1 c. c. quantities each forming a single dose. Comparative studies on the clinical effects of carbolized and heat-killed vaccines show that the former is considerably more efficient than the latter though at times it may give rise to slightly greater local reaction. The discovery of the existence of labile antigens such as the V_i antigen of Felix and Pitt (1934 a and b) and the pertussis antigen of Evans and Maitland (1937), lends support to our view based on clinical evidence that prolonged heat at 56° C. may be destroying some factor or factors possessing immunological properties. The good results often obtained by the ordinary methods of vaccine therapy are attributed by some observers to the small amount of toxin or toxoid that may be present in the particular vaccine employed. (Dolman, 1935). This seems to be too harsh and strained a judgement against vaccine unsubstantiated by ample experimental evidence. It does not seem possible that immunization with toxoid alone can produce complete resistance against this infection, in which there is positive experimental evidence to prove that the endotoxin also plays a pathogenic role in the production of lesions. Unlike the diphtheria or the tetanus bacillus, the staphylococci possess considerable invasive properties.

The Toxoid Treatment.—The toxoid or anatoxin is the detoxicated toxic product which retains its antigenic property. It also combines with the specific antitoxin in the classical fashion. Detoxication is effected by treatment with formalin. The process is more rapid than that of diphtheria toxoid, 0.2 or 0.25 per cent of formalin acting for twenty-four hours at 37°C. being enough for complete detoxication (Burnet, 1931 a.). But

for this, the behaviour of both these toxins to formaldehyde is exactly the same. The rate of detoxication depends upon four factors—the concentration of the formaldehyde, pH of the medium, temperature and time. Besides, the concentration of extraneous material present in the filtrate and capable of reacting with the formaldehyde may slightly influence probably by altering the concentration of formaldehyde. Detoxication is more rapid at the alkaline side of neutrality. Complete detoxication occurs when all the toxic activities have disappeared and 40-50 lethal doses injected intravenously produce no symptoms of any sort in the test animal. The resulting product, though non-toxic, forms an effective primary or secondary antigenic stimulus in experimental animals and in man. The antitoxin-binding power is retained up to 50 per cent. of the unmodified toxin according to Burnet (1931 a); but Smith (1936) says that under suitable conditions a toxoid should retain at least 70 per cent. of its original combining power.

The introduction of the toxoid as a therapeutic agent has resulted in greater attention being paid to the preparation of a suitable product for general use. It must pass certain tests before it can be issued for use. Due care has to be taken that the toxoid is sufficiently potent and can be relied on to stimulate a good antitoxic response in the average subject. Its innocuousness also must be tested previously. The staphylococci seem to be capable of elaborating a number of products with distinct antigenic identity and it is desirable that all such antigens are present in the toxin from which toxoid for therapeutic purposes is to be prepared. But it is known that no one strain produces a complete toxin at the same time. Hence it is necessary to have a pooled toxin from four or more selected strains. As formalin fails to detoxicate the enterotoxin, no enterotoxin-producing strain should be used in the production of toxoid for active immunization. (Dolman, Wilson and Cockcroft, 1936). Dolman and Kitching (1935) lay down that the M.H.D. (minimum haemolytic dose) of the toxin used should not exceed 0.002 c.c., the M.R.D. (minimum reaction dose) 0.0005 c.c. and the M.L.D. (minimum lethal dose) 0.25 c.c. per kilo. Dolman (1935) prepares the toxoid by incubating a pooled toxin of high potency for 7-14 days at 37° c. in the presence of 0.1–0.15 per cent. by weight of HCHO. On testing, a sample should prove free from the rabbit cell haemolysin and from the dermo-necrotic and the lethal properties. Five cubic centimetres injected subcutaneously into guinea-pigs and 0.5 c.c. intraperitoneally into mice should cause no untoward effect. As the enterotoxin is not detoxicated by formalin, Dolman et al (1936) also lay down that 3 c.c. of the toxoid, injected intra-peritoneally into a normal kitten, should occasion no ill-effect. Whether the toxoid contains any lysed bacterial substance is not known. Even if there is any small quantity, it contributes little to the therapeutic efficacy of the toxoid and the good results sometimes observed with the vaccine is probably due to the toxin or the toxoid contained in the particular vaccine employed (Dolman 1935).

The course recommended for subacute and chronic cases consists, in the first place, of four intramuscular injections at intervals of 5 to 7 days, the total amount injected being 0.75 c.c. Small increasing doses are used such as 0.05, 0.1, 0.2 and 0.4 c.c. It is important to estimate the antitoxin content of the blood before treatment and about 10 days after the last dose so as to determine the antitoxic response of the individual. For, the best rule according to Whitby (1934) is to aim at stepping up the antitoxin titre to at least 10 times its original level rather than to aim at any fixed flat level. Individuals vary considerably in their antitoxic response, which is influenced in some measure by their initial titre. Some have a high titre at the onset especially those with deep seated lesions. Individuals recently infected usually have a slightly higher titre than others. In such individuals it is easier to increase the titre than in those with low initial titre. In small and localised lesions such as acne, boils, blepharitis, the antitoxin content of the blood is low and is not much more than that of the normal serum. The following figures are taken from Murray (1935).

A. T. in blood.	No. of cases.	Average Unit* per c.c.
New born ...	50	0.78 0.765
Pregnant woman ...	50	0.75
Acne ...	30	1.03
Blepharitis ...	14	0.90
Furunculosis ...	35	0.03 0.96
Carbuncles ...	8	0.60
Others ...	21	0.92
Osteomyelitis ...	7	11.7

* International unit of staphylococcus antitoxin (antihaemolysin.)

Why there is no antitoxic increase in the blood in the case of localized lesions is not clear. Probably the toxin remains localized in such cases attached to the surrounding necrotic tissue and there is no general stimulation; whereas in lesions like osteomyelitis the toxin is in general circulation.

The course of treatment has to be carefully followed as the patient would have developed or may develop hypersensitivity either as the result of the natural infection or artificial immunization (Panton, Velentine and Dixon, 1931). It may be harmful to continue the injection beyond a certain number; for often it has been noticed that the level of circulating antibodies suddenly and rapidly falls as the course of immunization proceeds beyond a certain stage and such falls are associated with clinical relapses (Panton, 1937). However, a second course after a few weeks' rest may be necessary in most cases. In intractable cases an occasional small dose of toxoid should be given at long intervals for some months after apparent clinical cure. Such cases probably are carriers and harbour the organism in their throat, nose or accessory nasal air sinuses. It should not be used in severe, acute or generalized infections.

Further advantages of the toxoid are that the dose can be accurately graded, the progress of treatment can be controlled by antitoxin estimation of blood, the local reaction is remarkably slight and serious reactions are extremely rare.

The several favourable reports (Dolman, 1933; 1935; Whitby 1934, 1936; Parish, O'Meara and Clark, 1934; Muray, 1935; Connor 1935; and Panton 1937) on the therapeutic value of staphylococcal toxoid, leave the impression that properly controlled treatment with a potent toxoid would give much better results in localized staphylococcal infections than any other form of treatment. We have treated a limited number of cases of recurrent chronic furunculosis with the toxoid. With two injections of 0.05 and 0.1 c.c. each the effect was noticeable and there was only slight local and general reaction. The final result was more satisfactory than that obtained with the vaccine treatment. The following results taken from Murray (1935) give some indication of the effect of toxoid treatment:—

	1.5 units or less.	2 units.	3-8 units.	11-38 units.
Before treatment ...	89 cases	10 cases	1 case	0 case
After 4 doses total = 0.75 c.c. ...	2 cases	13 cases	58 cases	27 cases

After titre after 0.75 c.c. of toxoid (102 cases) = 7.6 units.

	Recovered.	Improved.	Slight effect or nil.
Before	0.96 unit	1·1 unit	0.95 unit
After	8.9 unit	7.0 unit	2.55 unit
Increase	x 9.0	x 6.4	x 2.7

All these cases were chronic and there was some correlation between clinical improvement and the amount of antitoxin rise. Thus it is clear that the amount of circulating antitoxin can be increased by active immunization with toxoid and that toxoid is worth using. The toxoid immunity may last for a long time, but it does not seem to be quite regular. 5-8 units per c.c. may be enough to bring about clinical recovery. The antitoxin probably acts by counteracting the defence mechanism of the organism exposing them to the defence forces of the body such as the phagocytes.

Relative value of vaccine and toxoid.—Downie's (1937) controlled experiments on rabbits throw much light on the relative value of vaccine and toxoid in active immunization. He immunized one series with toxoid and another with suspensions of heat-killed cocci washed free of all toxin. The toxoid immunized rabbits developed a high degree of immunity and gave little reaction to intradermal injection with a powerful toxin and only small localized and rapidly healing lesions after injections with living cocci, while the control animals reacted severely both to the toxin as well as the live cocci. The other series of animals developed no immunity and responded to toxin or living cocci just as control animals did. The protective value of the sera of the toxoid immunized rabbits was high while it was little better than the normal sera in the vaccine-immunized ones. Kitching and Farrell (1936) also found that while rabbits immunized with vaccine showed only agglutinins in high titre, those immunized with the toxoid showed a high content of protecting antibodies in the blood. From theoretical considerations a combination of a suitable vaccine and toxoid should give the best results.

Antitoxic serum, when given to mice and rabbits before a certainly fatal dose of living staphylococcal calture, prolongs and in some cases saves life. It protects the laboratory animals passively against several lethal doses of a potent toxin. One would reasonably infer from these results that it may be useful in

man also. An efficient therapeutic serum from a horse immunized with repeated injections with a toxin or toxoid gave encouraging results in severe and acute infections such as acute osteomyelitis and septicaemia, where prompt action was essential (Panton, Valentine and Dixon, 1931; Parish, O'Meara and Clark, 1934; Whitby, 1934). The serum may be followed up with a course of toxoid when the acute stage is passed. An international antitoxic unit has been established. As with other antitoxins, both purified and highly potent products can be obtained. But in spite of these it has not so far made a mark and there is no clear indication that serum treatment is of any value in man.

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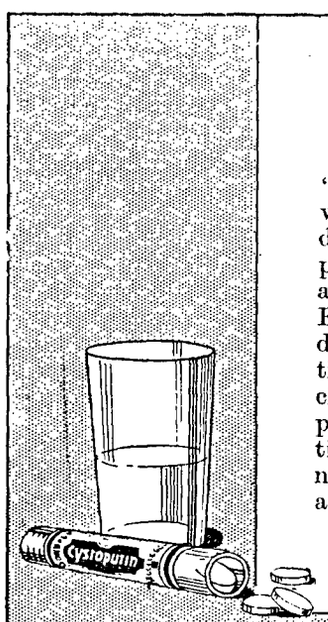

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Tropical Diabetes—Its Dietary Problems And their Orientation *

BY

P. Gopalachari, M.B., B.S.,

Diabetes Research Worker, Madras.

THERE is no gainsaying the fact that many authorities are agreed in that, purely dietetic treatment should first be tried in diabetes before Insulin of various brands or other drugs are resorted to. The ideal to be aimed at is to improve the Carbohydrate intolerance prevailing in the patient. It is the primary effect of the metabolic disease process obtaining in the organism. Hence the need for improving the carbohydrate intolerence is emphasised, particularly long before a series of catastrophe sets in the individual manifesting in the different clinical diabetic syndromes. These are to be traced to varied origin and different morbid anatomy and hence are liable to different courses, as adumbrated by Sir John Rose Bradford. However, this dietetic aspect of the therapeutic problem would seem to be still in a chaotic state, the literature containing conflicting statements, misleading discussions and obvious errors. There is therefore a necessity for a selection of those statements, which seem to bear the greater weight of authority, as well as an investigation on the articles of diet. The mere withholding of some of the diets, from the patient, has the effect of improving the tolerance to carbohydrate in a diabetic.

The different schools of thought in the dieting of diabetic cases are weighted and where such difference of opinion exists, it is perhaps well to have it settled, for which more information would be needed. An attempt is therefore made to present a critical survey and a resume thereof.

Nyogi and Narayana have brought out by their assay of the net protein value of the globulins of the different Indian variety of pulses, the superiority of ciser ariatenum to Phasealus mung and radiated dhal and all the rest of them. The same, when exhibited to diabetes, does not stand comparison to Phasealus dhal, as judged by its effects on the blood sugar concentration levels. The necessity for similar studies on the commoner food proteids and a determination of their respective efficacy to

* Specially contributed to "The Antiseptic".

maintain the diabetic in a nitrogen balance, is brought out, especially in view of Embleton School of thought, which lays so much stress on the efficiency of a sample of high protein diet, that it brings about a return to normal or nearly normal sugar tolerance. A list of forbidden articles of diet is submitted based on the deterioration of urinary sugar excretion and blood tests. An attempt has been made to give sufficient reference to the literature to enable those that are interested in this particular phase of discussion to pursue their investigations further. The references serve the double purpose of giving the authority from which certain statements have been made and of acknowledging the author's indebtedness for the information given.

If the author has succeeded in creating a greater interest in Indian diabetic problems without sustaining a belief either that the last word has been said on the topic or that other countrymen's findings will apply to tropical conditions, the author will feel amply repaid for the work which has been necessary in the assembling and editing of the materials herewith presented.

The Three Main Schools of Dietetics in the West.—1. Following the introduction of insulin into the therapeutics of diabetes mellitus, there has evolved the Sansom School of dietetics. It comprises a high carbohydrate and caloric diet to, carry on an active energetic life. But it is low in the fat and protein fractions. A diet of 250—350 gms. of carbohydrate, 70 gms. protein and fat 50 gms. would represent the new change of diet from an original diet of fat=250 gms., protein=70 gms., and carbohydrate=50 gms. Rabinowitch recommends that the fat of the diet must be decreased to very small amounts. This would help to reduce the high cholesteraemia and blood pressure obtaining in the diabetics of the West. But Graham (1938) says that his patients do not want to eat so much carbohydrate and they would sooner or later rebel against such severe restrictions of fat in their diet. He suggests that if an adult cannot tolerate 100 gms. of carbohydrate, he must be given insulin but for the growing younger patients he would recommend 130—230 gms. of carbohydrate. Precisely it is this type of high carbohydrate, low protein and fat diet, that is found to obtain in South India after an extensive survey of the nutrition of its people by McCarisson characterised as the "poor Madrasi diet," it is essentially an unbalanced diet, that stands to be deprecated for the nutrition of any people. It is at best, therefore, an

expediency to balance this excessive carbohydrate with necessary dosages of insulin, to a diabetic, attention being focussed to relieving his symptoms, like polynuria, glycosuria and weakness resultant of dehydration, for a while, rather than to the ideal of rectifying the main defect that has brought about his carbohydrate intolerance and the resulting hyperglycæmia.

2. As opposed to this radical School of Rabinowitch, Sansom and others is the conservative school of Newberg and Marsh. It consists in giving a high fat, low protein and carbohydrate rations. At the outset the diabetic is placed on a 1000 caloric diet of which fat=90 gms., protein=10 gms. and carbohydrate =14 gms. When he is sugar free on this starvation diet for 1—2 weeks the diet is increased to 1400 calories just sufficient for his basal metabolic requirements. A second increase to 1800 caloric diet consisting of fat=170 gms., Protein=40 gms., and carbohydrate=30 gms., when tolerated can be further increased up to 2500 calories.

Even before the ketogenic and antiketogenic ratio was promulgated they showed empirically the advantage of a low caloric diet and protein not exceeding 0.67 gms. per kilo of body weight in the prevention of acidosis, even when the diet was largely composed of fat. Extraneous fat through diet is less harmful to a diabetic than his own body fat called upon during the metabolism of starvation and hence the need for a sufficient caloric diet to an obese diabetic is all the more felt.

The demerits of this system are: (1) a patient breaking over a diet of carbohydrate pays an immediate penalty of polyuria and excessive glycosuria, but a patient who breaks a diet chiefly of fat or protein is not warned but dies of coma. However, it demonstrates the safety with which under-nutrition can be unnoticed to desugarize the urine. (2) The carbohydrate allowed is chiefly in the form of vegetables and fruits. (3) It is an infallible diet that is prescribed indiscriminately to all types and grades in the severity of diabetics. (4) Petren of Copenhagen however advises against the use of low protein if patients be over 50 years of age and the disease is of long duration, unless his blood sugar is and above 0.2 mg%. He advises the patient with acidosis to give up meat or fish for life. The great majority of his really severe cases eventually do not take more than 50 gms. meat and no eggs or at the most two eggs only; (5) Petren and Odin have also proved that in a subject on prolonged restriction of carbohydrate it ultimately leads to a diminution in the production of Insulin by the Islets Langerhans. (6) D. McCay (1916) has found a very close relationship to exist, other things being equal, between the blood sugar content and the degree of fat deposit in the tissues of the Bengalees. His results show that the fat, flabby, indolent person is more

likely than the lean, hard working, poorly fed to show hyperglycæmia or glycosuria on adding equal quantities of glucose to the diet. (7) When the diet habit is to take negligible amounts of fat, either of animal or vegetable origin as evidenced in the blood cholesterol content of South Indians,it is hardly practicable or politic to introduce this high fat diet of Newberg and Marsh. The average blood cholesterol in diabetics has been found to be 173.5 % as against a normal average of 136.7 mg. % as shown below :—

NORMALS.			IN DIABETICS.		REMARKS.
No.	R. S. Mg%	Cholesterol. (Whole Blood.)	R. S.%	Cholesterol. Mg% (Whole Blood.)	
1	.098	152.7	.3478	133.3	
2	.070	148.0	.1146	120.0	The cholesterol estimation is by the Reinhold and Shielz modification of the Myers and Wardell method.
3	.090	115.7	.2312	181.8	
4	.047	121.9	.140	150.0	
5	.070	121.3	.250	160.0	
6	.089	143.0	.1834	150.0	
7	.062	160.0	.1274	142.9	
8	.087	127.0	.1754	125.0	
9	.071	111.1	.1780	161.9	
10	.078	166.6	.2380	142.8	Blood sugar estimation is by the Folin's techniques.
11			.1826	200.0	
12			.210	235.3	
13			.125	222.2	
14			.120	120.0	
15			.125	235.3	
16			.160	235.3	
17			.08	146.9	
18			.400	205.0	
19			.1379	200.0	
20			.235	160.0	
21			.160	262.6	
22			.099	181.8	
23			.211	235.3	
24			.169	160.0	
25			.2106	160.0	
26			.1632	266.6	
27			.1230	160.0	
28			.129	200.0	
29			.190	148.1	
30			.296	160.0	
31			.1600	148.1	
32			.1700	160.0	
33			.1570	129.8	
34			.2548	262.6	
35			.2100	190.5	
36			.381	148.1	
37			.160	190,5	
38			.2469	170.2	
39			.1333	235.3	
40			.2500	160.0	
41			.1200	138.0	
Average		136.7%		173.5%	

3. The Allen School of thought was directed to the quantitative aspect of diet mainly. It restricted the patient to a substandard and starvation level of intake of food to keep the urine for ever sugar free. It is naturally very much resented by the patient, particularly by those with the milder grades of severity in their diabetes. Where acceded to this life sentence of an undernutrition, it encourages cardiovascular degeneration to set in early and possibly other complications due to enforced malnutrition. A clinical and laboratory investigation on diabetes of South India has revealed without exception evidences of organic damage to the kidney and heart, besides the liver inefficiency. This kidney defect McCay (1908) ascribes to chronic protein starvation. Experience has shown the laity and the profession that human beings can adapt themselves at a low level of vitality and powers impaired to an insufficient ration. Cannon (1932). On such substandard diets many diabetics drag on for a period of ten years and over that has been prescribed by Joslin as the test of efficiency of any line of treatment to a diabetic towards a prolongation of his life-span and not get it snapped by a complicating acidosis. These cases constitute the "mild" types of Tropical diabetes of India and Ceylon, (G. Graham).

Embleton (1938) while recognising the advantage of diabetic management of diabetes advocated by Allen, concentrates attention to a high protein aspect of the diet primarily as did Rollo in 1797. He has succeeded in effecting a normal or nearly normal sugar tolerance in cases of moderate severity of diabetes after instituting alternate courses of high protein and fruit diets but restricting their carbohydrates and fat values. A question arises, "Is such a dietary indicated, if so, is it practicable in tropical diabetes?". The two following cases are illustrative of its soundness and practicality. There is no weighing etc. trouble required in this regimen. It appears to have been practised by Col. Donovon also in the beginning of this century at Madras.

Diet Habit	Weight	B. P.	GLUCOSE TOLERANCE.					REMARKS.
			R. S.	½	1	1½	2 Hours	
Vegetarian	166	$\frac{110}{90}$	.114	.160	.210	.222	.182	Before treatment.
	152	$\frac{120}{90}$	.0938	.1250	.1829	.1596	.0754	After 3 months of treatment on 10-6-'38.
Non-Vegetarian	224	$\frac{105}{80}$	.182	.222	.364	.286	.267	Before treatment.
	208	$\frac{120}{70}$	.133	.190	.216	.216	.186	After 8 months of treatment on 12-12-'38.

A return to nearly normal glucose tolerance even in the severer non-vegetarian, an increase in pulse pressure and reduction in the weight of the patients are points of interest. The increased amino acid nitrogen of blood at resting condition in diabetics of South India, reported on and discussed in another paper by the author, bears testimony to the protein starvation and it is possibly due to tissue autolysis as suggested by C. H. Greene et (1923). There is, therefore, need for a protein type of diet to diabetics of South India. In this behalf, E. E. Waters prescribes a minimum of .75 gm. of protein per kilo going up to 1 gm. in tropical diabetes. But W. R. Aykroyd (1937) believes that 65 gms. of protein per diem, the basal requirements of an adult, though short of modern physiologist's requirements is nevertheless excessive in the sense that economic circumstances of the Indian and his dietary habit, prevent its attainment. He ventures to think that no combination of vegetable protein can promote growth or tissue repair unless at least $\frac{1}{3}$th of the protein supply is from the animal source, to lay the foundation of a healthy vigorous manhood. It is another aspect of dietetics of particular interest to the vegetarian class of diabetics. It is to the supplementary effects of protein on one another, the value of mixed diets is partly due. Mixed foods of purely vegetable origin show little, if any, supplementary effect. Lloyd and Shore (1938).

Cooking and Digestibility.—Mendel and Fine (1911) have shown that the apparent low digestibility of protein of cereals and legumes is due to the fact that they are present in the food mixed with large quantities of indigestible cellulose which protect the protein from Enzemic action and that their isolated proteins, globulin and albumins, however, are as easily digestible as meat itself. This raises the importance of cooking the diabetic foods. Cooked eggwhite is digested more easily than raw egg-white, Mendel and Lewis (1913), although more slowly than meat. This coagulated ovalbumin is easily digested by pancreatic proteinase. With pepsin, however, this coagulation does not increase rate or extent of hydrolysis. It is possibly due to an alteration in the linkages of the molecule and it is therefore of much importance where there is pancreatic insufficiency or dysfunction. Clifford (1930) has shown that cooked meat is digested by trypsin in vitro more easily than raw meat, but overcooked meat is digested more slowly than under-done meat. Overcooking tends towards indigestibility owing to the extensive

coagulation and shrinkage of cell proteins with resultant loss of available surface for Enzymic action. (Lloyd and Shore.)

The deterioration that followed the high protein diet in partially depancreatized dogs in the past is now definitely proved to be due to lack of digestive ferments of the pancreas rather than to lack of insulin.

Joslin has drawn attention to the gastric insufficiency developing with the chronicity of diabetes mellitus. The diabetic must be therefore placed on a diet that his stomach and pancreas can take care of. E. M. Frankel (1916) says that the best index of protein digestion is the ratio of amino acid nitrogen at a given time to total Amino nitrogen after complete hydrolysis. On this basis and working either with pepsin and trypsin independently, or when latter is superimposed on the former to digest cow-casein, Dunn, M. S. and Lewis, H. B. (1924) have brought out the easier digestibility of casein with trypsin after preliminary digestion with pepsin. The researches of R. B. Gode et al (1930) have confirmed their findings and brought out the greater difficulty in digestion of buffaloe casein. Aids to digestion besides other general hygienic measures are *sine qua non* to a successful dietetic therapy of diabetes.

Conflicting and contradictory, as these systems of dieting may seem to one another, it is of interest to note what Dubois and Richardson have shown that it is not the protein or fat or carbohydrate that is given to the diabetic that counts but that which is burned as proven by calorimetric determination is the deciding factor.

Forbidden Foods.—Differences between the biological value of one and the same protein for maintenance and growth and between different proteins for both purposes are due to differences in the amino acid requirements of the two functions and the variation in composition that exists between different proteins. The more closely the composition of the dietary proteins approaches to those of body protein the greater is their capacity for providing for growth and repair. Lloyd and Shore (1938). While some proteins are beneficial, others are found detrimental to the well-being of a diabetic as detected by increased glycosuria or hyperglycæmia ; the mere withholding of these helps to desugarize the urine.

Among flesh foods : (1) Prawns; (2) Fowl, (3) Eggs are not found to be desirable to a diabetic (Author 1937). (4) Among pulses : P. Mung dhall is found superior to the protein of cicer ariatenum in its efficacy to keep down the blood sugar concentra-

tions to lower levels in diabetics, when given alone or along with glucose in equal amounts as shown below :

Nyogi and Narayana have isolated 25.04% of true protein from cicer ariatinum and 25.25 % from P. Mungo and the protein value is theoretically the same in both.

DIABETICS.	AFTER P. MUNGO.			BLOOD SUGAR CONCENTRATIONS.			REMARKS.
Case No.	1 hr.	2 hrs.	2½ hrs.	3 hrs.	3½ hrs.	4 hrs.	
1	2516	2000	1941	1932	1835	1830	Note:—The gradual lowering of the Blood sugar concentration levels possibly due to dicarboxylic and protein fractions of the non-protein nitrogenous constituents present in large amounts (Bhaghavat).
2	3203	2919	2914	2900	2814	2811	
3	2477	2454	2260	2162	2094	2030	
AFTER CICER ARIATENUM BLOOD SUGAR CONCENTRATIONS.							
4	2048	1905	2259	2222	1818	1905	Note:—The rise after a fall in the blood sugar concentration levels; hence its inferiority to P. Mungoin diabetic metabolic process.
5	1914	2340	2062	1835	1206	2539	
6	1379	1444	1905	1219	1123	1232	
7	2208	2758	2666	1500	2150	2564	

Proteins from all sources are not equally utilized by the body owing to their different make up, with their amino acids constituents. Chouduri and Kahali (1936) have demonstrated that the average absorption coefficient at the optimal concentration of glucose from the bowel is lowered by subcutaneous injection of Insulin. Proteins that possess a similar effect after absorption from the bowel in retarding or rapid sugar absorption from the bowel into the blood or lowering its existing high concentrations are welcome to a diabetic. The amino acids of P. Mungo answer the purpose very well. Experiments go to show that it very nearly equals pure casein, in the modulation of the hyperglycæmic curve following the administration of pure glucose ; when either is given to a diabetic, in the same proportion of protein to carbohydrate in the food mixture. (5) Fat as already indicated is forbidden, as tending to increase hyperglycæmia and obesity. Embleton has found clinically, that (6) Alcohol (7) Saccharose and (8) Starch encourage to weight increase and hyperglycæmia ; (9) Root vegetables including potatoes and even the leafy vegetables when fried are fruitful sources of taxing the enfeebled digestion and producing increased glycosuria; (10) Among fruits, it is found that mangoes, plantain, jack and papaya as dasseris are productive of an excessive urinary sugar excretion. It is possibly due to their high carbohydrate values. While a diet that is enough to enable human

beings to lead an energetic life at a reasonably high level of working capacity is the ideal to be aimed at in modern dietetics, a diabetic offers no exception to this rule. His diet should help him to build up a constitution healthy and strong so as to withstand successfully any infection and live his full span of useful life.

Conclusions.—1. The different systems of dieting advocated in diabetes are discussed.

2. There is support to Rollo's theory of 1797 for an increased protein consumption by the diabetics of South India, towards an amelioration of their conditions.

3. A list of forbidden foods is drawn up based on clinical and laboratory data.

4. The importance of adequate cooking in diabetic dietary is brought out based on experimental evidence.

5. The digestive power of the diabetic needs closer attention.

6. P. Mung dhal is found to be beneficial to a diabetic owing possibly to its high dicarboxylic or protein functions of its amino acid constituents. It is superior to cicer to meet the requirements of Diabetic Metabolism.

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Allergy in Relation to the Nose and Throat*

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THE subject of this paper opens up such a wide field for description, discussion and research, that I shall content myself with dealing mainly with its clinical aspects. Apart from references to statistics of large number of cases, published by Continental, American and British observers, and to the statements and opinions of some of the well-known authorities on the subject, this paper will be a presentation of my own observations and inferences, based upon the notes of my private cases, and the general impressions obtained in dealing with a much larger number of out-patient cases in hospital, of which, unfortunately no records are maintained.

The clinical manifestations of allergy have been summed up neatly by J. A. Munro Cameron in his Logan Turner Prize Essay of 1935. They are :—(1) Increased permeability of the capillary endothelium. (2) Stimulation of glands. (3) Contraction of smooth muscle.

These symptoms, in whichever part of the body they occur, and with whatever degree of severity, usually appear abruptly, are essentially of short duration, and are prone to recur over and over again. According as to the part of the body or the particular tissue which is the chosen site of allergy in a given case, we give different names to these manifestations; the number of such conditions has been continually increasing as more and more work has been done on the subject, but I believe that the following list includes most of those disorders in which allergy is an accepted ætiological factor. Bronchial asthma, vaso-motor rhinorrhœa, migraine, angioneurotic œdema, urticaria, eczema, Besnier's prurigo, arthritis, gastro-enteritis.

Before entering the subject proper of this paper, I may be permitted to recapitulate briefly the ætiological factors concerned in the production of the allergic state, and some of the important biochemical changes associated with it. The list of causative

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factors is an extensive one, but for purposes of easy memorisation I have reduced it to an alphabetical mnemonic which I make use of while taking down the family-history and personal-history of my allergic patients.

Alimentary.—(1) food—especially milk, beverages, cereals, fish, meat, eggs, vegetables. (2) Intestinal parasites.

Bacterial.—(1) Acute infections in the past history. (2) Focal sepsis anywhere in the body.

Chemical.—(1) Drugs—especially aspirin, barbiturates, quinine, ipecac, iodine, arsenic, bromides. (2) Cosmetics—face-powder, lip stick, etc.

Dust.—(1) House-dust—bedding, upholstery, carpets, pet-animals and birds. (2) Dust of surroundings of the house—animals; flowers, shops which sell food-stuffs, etc. (3) Occupational dust—as in mills, factories, bazaars, etc.

Besides these, there are the vaguer factors which also predispose to allergy, namely, physical or climatic, psychical and endocrine. Lastly, and certainly not the least important, is the hereditary factor. The incidence of this factor has been variously estimated, but I feel that if a careful and patient history-taking is done in all our cases, laying stress upon the patient's review of his geneological tree for three generations, and enquiring not only about "any asthma in the family", but also its equivalents such as migraine, urticaria, etc., we would discover a strikingly large percentage of patients who possess family-histories sodden with allergy. To illustrate my point, I might mention that out of 33 consecutive cases of typical vasomotor rhinorrhœa in my private practice, no fewer than 16, (*i.e.*, nearly 50%) gave family-histories of asthma or its equivalents. Forty members belonging to these 16 patients were suffering from asthma, urticaria, migraine or eczema. In one case, the maternal grandfather, the grandmother's sister, and the patient's three sisters were asthmatics; in another,five brothers and sisters of the patient had Besnier's prurigo in their childhood.

The biochemical abnormalities which accompany allergic conditions are important, not only as aids to diagnosis but from the point of view of prognosis and treatment. They are :—

(1) Hypochlorhydria or Achlorhydria.

(2) Lowered blood-calcium, even down to 60 mgm. (Normal is about 150 mgm.)

(3) Lowered blood-sugar, especially in children.

(4) Increased amino-acid content of blood, up to 20 mgm. of Nitrogen per 100 c.c. (Normal is about 5 mgm.)

(5) Eosinophilia, both general and local (*i.e.*, in the affected tissues.)

With this general preamble, we might now get to grips with our special problem, namely, the relationship of allergy to the nose and throat. I think we should answer two questions first, in order to assess this relationship, if it exists at all. One question is the converse of the other.

1. *What is the incidence of Allergy in nasal conditions put together?* All observers are agreed in the answer to this question—that the incidence is very low. Munro Cameron, for example, gives the percentage of vasomotor rhinorrhœa as about 5% of the total E. N. T. cases treated in the Glasgow Victoria Infirmary during seven years.

2. *What is the incidence of nasal pathology in allergic cases?* Here we tread on dangerous and shifting ground; for the figures given by various authorities are very dissimilar, as also their inferences regarding the importance of the laryngologist's role in the diagonsis and treatment of allergic conditions. As an instance of one extreme, an article by Moll in the B. M. J. (Aug. 18th 1934) reviews the findings in 337 cases of asthma, in which abnormalities of the nose and throat were discovered in nearly 80% of the series, and improvement resulted in over 50% of the 105 cases which were followed up after receiving operative treatment; the author states the nose is the most important source of reflex asthma. In contrast to this view, we have the survey of James Adam, that doyen of Glasgow laryngologists, who has written a monograph on Asthma; he found nasal polypi (mostly of the eosinophil type) in about 14% of 1500 cases of asthma. Van Leeuwen of America, who has written a book on 'Allergic diseases', criticises the high figures obtained by some observers, and states that sinusitis (for instance) occurs in not more than 10% of asthmatics. Whichever set of statistics we might select, the fact emerges that allergic patients reveal a markedly higher incidence of pathological conditions in the nose and throat than do non-allergic patients.

What are these pathological states that we find with such exaggerated frequency in allergic cases? The commoner ones are:—

1. *Vasomotor rhinorrhœa*:—By which is meant the condition characterised by the syndrome attacks of sneezing, profuse watery nasal discharge, nasal obstruction, with or without headaches; and showing on examination the typical 'peach-bloom pallor' of the nasal mucosa which looks 'wet' and sodden, though there is generally no hypertrophy between the attacks; "sensitive spots" on the postero-superior part of the nasal septum and on the turbinates, which evoke sneezing or coughing on being touched with a blunt probe (Mc Bride's 'cough-spots') may be found in some of these cases.

2. *Nasal polypi*:—The typical allergic polypi are bilateral, multiple, small, sessile and present on histological examination an unmistakable eosinophil infiltration.

3. *Paranasal sinusitis*:—Maxillary sinusitis is the most easily and therefore most commonly diagnosed; but ethmoidal and sphenoidal infection should be sought for in all allergic cases.

4. *Deviations of the nasal septum*:—Septal deviation is now recognised to be normal rather than pathological; so unless we find gross deflections which produce real obstruction, or spurs which press upon the lateral nasal walls, we would not be justified in classing septal deviations among the pathological findings in allergics.

5. *Hypertrophy of the turbinals.*

6. *Chronic follicular tonsillitis*:—As evidenced by a history of frequent sore-throats, the expression of thin liquid pus from the crypts on pressure against the anterior pillars of the fauces, and enlargement of the glands behind the angles of the jaw (especially in children).

Granting that the sum-total of these throat and nose conditions is greater, proportionately, in allergics than in the non-allergic population, the question naturally arises as to whether the nose and throat pathology is the cause or the effect of allergy. A lot of discussion and controversy has taken place over this problem; but it seems to me that there has been confusion of thought and lack of proper perspective displayed by several protagonists of either view. If we could accept certain broad rules with which to assess the significance of nose and throat pathology in allergics, if we are provided with guides as to the prognosis in each individual case, if we investigate, not only the nose and throat, but all the aspects of allergy in each patient, and if we pursue rational methods of treatment of the throat and nose—then I do not see why the vexed problem of cause and effect should be incapable of solution in this particular field any

more than it is in other branches of medicine. What are these rules and guides that we might adopt? I think I might best present them for your consideration by describing how I generally investigate cases of allergy, and during the process how I evaluate the nose and throat factor, both with regard to the production of the patient's symptoms and to their possible cure or alleviation.

Investigation of Allergic Cases.--1. *Family history*:—I have already indicated how patience and proper questioning will often elicit the presence of an allergic family diathesis,which would be missed entirely by a cursory enquiry. I regard the presence of a definite family predisposition as of bad augury to the prognosis; treatment of the nose and throat pathology is unlikely to bring about a cure. for the simple reason that although the patient may (in the first instance)have been allergised through his nose or throat, he will probably allergise himself equally well in some other way by virtue of his Mendelian factor, as soon as we have dealt with his upper respiratory pathology. I would certainly protest against the resection of a slightly deviated septum or the repeated cauterisation of turbinals in allergic patients with a positive family-history.

2. *Personal history*:—The onset of asthma (which is the arch-villain of the allergy family) immediately after an acute infection should not only make us think of that general infection as having been the allergising factor, but should also direct our careful attention to the tonsils and sinuses which may be the reservoirs of that same infection; in such cases, by removing the septic focus in the nose or throat, we are reasonably certain that we remove the antigen, and the good results are often prompt and permanent. I recall a private case of mine, a student in the Law College, who consulted me for his asthma three years ago. There was a strong family history of asthma, but his first attack had occurred soon after an attack of *influenza* about a year before he first saw me. His tonsils were very septic, and I advised their removal, but offered a guarded prognosis as regards the cure of his asthma. On the third day after the tonsillectomy was done, the patient suffered one of the worst asthmatic attacks he had ever experienced. Since then to this day, he has not had a single attack. I have observed this exacerbation or flaring-up of allergic symptoms immediately following operative intervention in other cases also, and I consider the phenomenon to be an encouraging one as it indicates that

while removing the septic focus we have simultaneously given the patient an extra big dose of his bacterial antigen.

The duration of symptom is, as illustrated in the above case, a factor in the prognosis. So also is the nature of the symptom-complex. A patient who suffers only from asthma, or only from allergic eczema, is more likely to be relieved by attention to his nasal pathology than one who complains of migraine, urticaria, asthma and pains in the joints. It is likely in these latter cases that secondary septic or antigenic reservoirs exist in various parts of the body, which may flourish even after the primary focus has been removed.

I always go through every item in my 'mnemonic table' of ætiological factors while questioning every patient; and if I find reason to believe that the patient has been sensitized by any of the items in the 'Alimentary', 'Chemical' or 'Dust' groups, I place less value on abnormalities in the nose or throat than I would otherwise. A lady Medical student consulted me for a typical and severe form of vasomotor rhinorrhœa. There was no positive family-history, and the only likely item in my table was aspirin, which she always carried in her hand-bag. She was prepared for a cauterisation, which she had been advised elsewhere, but I advised her to eschew aspirin and salicylates and to take Calcium and Vitamin D. Several months later she reported that she was free from symptoms, though they tended to recur in a mild form whenever she stopped taking Calcium. Dr. James Adam has reported a case of a girl whose sinuses had been exenterated before she consulted him for allergic symptoms; he gave her a quarter of a grain of aspirin, which made her unconscious for a quarter of an hour; I need not stress, therefore, that it is only after a detailed enquiry into the possibility of other allergising factors, we shall be able to evalute the innocence or guilt of nasal and throat pathology in allergic patients.

3. *Examinations of the ears, nose and throat*:—(*a*) Vasomotor rhinorrhœa:—I am inclined to agree with Munro Cameron, who states that only about 50% cases of vasomotor rhinorrhœa are allergic in origin. He does not give details of how we can distinguish one type from the other, except by the discovery of eosinophil preponderance in the nasal discharge and nasal mucosa. It is not an easy matter to separate the two groups; my working rule in these cases is that if the family-history is positive, and if there is an increase of eosinophiles in the blood, I class the vasomotor rhinorrhœa as allergic. Again, in this

allergic type, if there are sensitive spots in the nose, I believe that cauterisation of these spots (combined with general treatment) favours the prognosis, not only with regard to alleviation of any existing asthma but (especially) in preventing asthma in the future. Six months ago, an Anglo-Indian girl of sixteen years of age was brought to me for a distressing vasomotor rhinorrhœa. Her father, who brought her, was asthmatic (had been so from his seventh year), and his only other daughter was also asthmatic. The patient used to sneeze every morning *about 20 sneezes to an attack* and would carry a stock of handkerchiefs. She had numerous sensitive spots on septum and turbinals, and resented even the touch of the speculum in the nasal vestibule. I cauterised the spots in three sittings and gave her a course of six injections of Calcium with Vitamin D, together with the same drugs orally. The day after the last sitting, she reported, that for the first time since she could remember, she had sneezed only once in the morning; three weeks later, she came to inform me that the running from the nose had entirely ceased, and that the last occasion when she sneezed was three days previously, and even then it was only a single sneeze! The cure in this case has now lasted only for about six months, but I have reason to be optimistic from my experience with similar cases in the past. I do not think that we should cauterise the turbinals in *all* cases of vasomotor rhinorrhœa, for such a routine procedure may do more harm than good.

(*b*) Paranasal Sinusitis:—I have not come across any convincing arguments to show that sinusitis can be the result of asthma. For one thing, as Munro Cameron points out, there is no reason why an allergic mucous membrane should be more liable to infection than a non-allergic one; besides, the lesions of allergy elsewhere, such as "the wheals of urticaria and the blebs of dermatitis, are practically never purulent" though they are more freely subjected to infection than is the lining membrane of the sinuses. Clinically also, it is generally agreed that in a condition so essentially allergic as hay-fever, the incidence of sinus disease is lower than in the average population. I believe that sinusitis, occurring in a person with an allergic diathesis, just as it can occur in anybody else, is liable to induce bacterial allergy in that person; similarly also, in the case of the tonsils. If we catch such a case early, soon after the onset of allergic symptoms, I think the prognosis is good with proper surgical treatment. Even without a positive family-history, there may be bacterial allergy, and in such cases, even with long

duration of symptoms, the prognosis is good after surgical procedures. It is in cases where we find sinusitis or septic tonsils in a patient with positive family-history and long duration of allergic symptoms, that the prognosis is difficult to judge—generally it is bad, with regard to the allergy, though the patients' general condition will usually improve after the eradication of any septic focus. In this last group of cases, I think it is important that we should not resort to heroic surgical measures such as radical operations on the sinuses. "A little surgery at a time" is likely to benefit the patient more.

(*c*) Nasal Polypi:—If these are typically of the allergic variety, I leave them alone—at least until I have given general treatment a thorough trial. If this treatment is successful, the polypi may disappear by themselves, or need to be removed only once, after the alleviation of allergic symptoms. On the other hand, if general treatment fails, there is no use of removing these polypi for they promptly grow again. Polypi which accompany sinus disease, however, must be removed. They are unilateral or bilateral, single, or multiple, large, pedicled and cause obstruction to breathing. The arguments for their removal are the same as I have advanced while discussing sinusitis. Even if his asthma is not cured by removal of polypi and treatmennt of sinuses, the patient is grateful for the restoration of the airway which he badly needs.

(*d*) Septal deviations and turbinal hypertrophy:—I have seen many allergic cases whose septums had been resected and bits of turbinals excised, and I have tried such measures in a few cases myself, but I have yet to meet a patient whose symptoms have been cured or relieved by these operations. I would submit that turbinectomy and septum-resection, except in extreme cases of obstruction (when surgery is indicated even apart from the question of allergy), are not only empirical and irrational but useless and even harmful.

(*e*) Septic Tonsils:—By which I mean chronic follicular tonsillitis. I have considered this pathological entity along with sinusitis. I would like to mention, however, that when we find unhealthy tonsils in an allergic patient, we are liable to be carried away by the elation of our discovery and to neglect a careful investigation of the sinuses. Thus it may happen that the patient derives no benefit from a tonsillectomy, and we lose faith in the existence of bacterial allergy, while all the time the same organisms as were lurking in the tonsils are thriving in the antra or sphenoids. If both the sinuses and tonsils require

operation, I deal with the nose first, as otherwise the tonsil-bed after tonsillectomy may absorb an alarming amount of bacteria antigens from the pus that flows down the pharynx from infecte sinuses.

I may refer, in passing to the condition called agranulocyto sis which is believed by some authorities to be a manifestatio of allergy to certain drugs, especially those containing th benzene-ring. The oro-pharyngeal lesions are said to be charac teristic (I have not seen a case yet), and a necrotic spot on th anterior pillar (Costen's sign) is described as an early and constan sign.

4. *Biochemical tests* :—I have enumerated the more impor tant variations in the blood-picture, blood-chemistry and gastri analysis which may occur in allergic individuals. For purpose of diagnosis, I generally depend upon eosinophilia (chiefly becaus it is the easiest and cheapest test), but from the point of view o treatment, I think the estimation of gastric HCL sometime plays an important part. Allergy is accompanied by an alkalosi and by estimating its degree we may not only be helped in ou prognosis but also in deciding our general line of treatment The first case in my experience, which brought home to me th value of gastric analysis, was that of a Gujarathi merchan aged 32, who had begun to suffer from mild attacks of asthma a few months before he consulted me. His father was an asthmatic The patient had a single ' cough-spot' on either side of the tuber cle of the septum, which I cauterised in two sittings (for fea of perforating the septum by simultaneous sloughs on both sides) Three weeks later he reported absence of asthmatic attacks bu persistence of nasal symptoms (those of vasomotor rhinorrhœa) He also spoke of indigestion and constipation. I had a test-mea done, which revealed marked hypochlorhydria. He was advise to take dilute Hydrochloric acid, starting with a drachm twic daily in the form of a sherbet (with sugar and lemon-juice i water) along with his meals. One year and two months later when he brought another patient, he told me that he was happy now, and always carried a pound-bottle of HCL dil. with hin whenever he was out of Madras. Not only were his asthm and nasal symptoms cured, but his digestion and general healt had improved remarkably.

5. *Skiagrams of the paranasal sinuses* :—May reveal laten sinusitis, especially in the case of the posterior ethmoidal an sphenoidal cavities.

6. *Histological Examination* of the nasal discharge and o

the mucous membrane removed from the nose and sinuses is not done by me as a routine.

Treatment.—I have dealt with the general guiding principles of prognosis and treatment already. Before describing in more detail the lines I follow in treating allergic patients with nasal or pharyngeal pathology, I would like to enumerate briefly some of the therapeutic measures of which I have little or no personal experience. They are :—

1. Direct anti-anaphylaxis—peptone therapy, etc.
2. Desensitization—elimination diets.
3. Radium therapy—it is said that the fibrosis produced acts as an " internal splint " to the mucous membrane of the nose and sinuses.

The lines of treatment which I practise can be summarised as follows :

1. A septic focus must be eradicated. In the absence of an allergic family-history, and if the symptoms are of recent onset, the prognosis is very good.

2. Sensitive spots in the nose may be cauterised once (in two or more sittings) in all cases where they are found to exist. But, if I may modify Chevalier Jackson's famous dictum, " All is not asthma that wheezes ", I would say, " All is not nasal asthma that sneezes ". I deprecate indiscriminate nasal cauterization.

3. Allergic polypi should not be removed at first sight. They may be removed when the allergic symptoms have been cured or relieved by general measures.

4. Gross nasal obstruction in asthmatics is corrected by conservative surgery. Most hypertrophied turbinals can be made to shrink by the patients adopting a proper diet, and taking regulated but vigorous exercise in the open air. The use of nasal douches is taboo in my practice and in my department in hospital.

5. General treatment, which I mention last, is really of the first importance. Without it, the most heroic surgery will fail ; and with it alone, many patients may be restored to health despite their possessing crooked septums and swollen conchæ.

(*a*) Attention to the stomach, liver and bowels:—At a meeting of the Scottish Otological and Laryngological Society held in Glasgow in November 1933, the subject of discussion was the same as we are considering today ; the late Dr. J. S. Fraser put a very pertinent question, " It is very simple to say that one

must employ general treatment in these cases; what is this treatment?" And Dr. Adam replied, "I would suggest to Dr. Fraser that he might do worse than give his patients a blue pill each Saturday night and a dose of Mag.Sulph. the next morning" There is no doubt that the liver, which is the great detoxicating mechanism of the body, does not function properly in allergic states,—witness the increase of amino-acids in the blood, which are normally destroyed or reconstructed in the liver. Besides this, the gastric juice is deficient in HCL; thus digestion is hampered, and bacteria survive and pass on into the intestines. The general vago-sympathetic imbalance which goes hand-in-hand with allergy upsets the proper tone and movements of the alimentary canal, which are so essential for normal digestion and excretion of poisonous waste-products.

I need not labour the point further. I start my patients with calomel and saline, and usually prescribe some mild correct-tive like Kruschen Salts for daily use, especially in the older patients. I have reason to believe, in this connection that liver extract and vitamin C are valuable adjuncts in our efforts to restore the normal functions of the alimentary tract and its associated glandular organs. The use and importance of Hydro-chloric acid in selected cases, I have referred to previously.

(*b*) "The path of physiological righteousness", remarks Munro Cameron in his Prize Essay, "is not an easy one for most of us; and for the allergic it may be doubly difficult". Neverthe-less, it is rarely impossible for the allergic to so modify his daily routine as to include moderate but vigorous exercise, plenty of fresh air, and perhaps a short holiday and change of environ-ment during the initial stages of his general treatment.

(*c*) Diet:—It requires a special study of dietetics to pres-cribe the proper diet for each individual patient; but bearing in mind that there is in allergy a shift of the acid-base equili-brium to the alkaline side, we should review the main features of the patient's usual diet, and modify it on broad lines whenever necessary. Proteins and carbohydrates are acid-ash producers, in the blood, in contrast to vegetables which are alkaline-ash producers. If I find that allergic patients are too fond of fruits and vegetables, I generally advise them to take these in moder-ation and to add fish or meat or other sources of protein to their diet. On the other hand, children who eat excessive sweet foods and confectionery are liable to have some disturbance of the calcium metabolism, for it has been found that too much

carbohydrate interferes with the absorption of calcium from the intestines. Cutting out chocolates may sometimes cure a vaso-motor rhinorrhœa or an incipient asthma.

4. Drugs:—I have referred in previous paragraphs to some of the drugs which are likely to be useful. I have to add only two more. Calcium is,in my opinion, the sheet-anchor in the general treatment of allergy. But it should be administered in such a way that it will be absorbed, and it should be continued for long periods of time. I usually start patients on a course of six injections of Colloidal Calcium with Ostelin, one injection every 5th or 6th day, and also Ostocalcium tablets by mouth (one tablet twice or thrice daily before food), the oral therapy being continued for several months in most cases. It may take some time for the results of calcium therapy to manifest them-selves, but they generally do, sooner than later, and are often very gratifying. The other drug I use is Bellorgal (Sandoz), for its help in correcting the vago-sympathetic imbalance, especially after surgical eradication of a septic focus. Three or four tablets a day for ten to twenty days serve to put the finishing touch, so to speak, to our surgical procedures. Endocrine therapy in selected cases is an useful adjuvant.

In conclusion, I wish to say that in presenting my personal observations and inferences, I do not expect that they should be accepted in their entirety; but I hope that they will serve to stimulate your interest in the fascinating subject which is the topic of this paper, and will provoke an exhaustive discussion, by which alone our thoughts and ideas can be clarified. The more I see of allergy, the more am I intrigued by its complexity and its variations, but at the same time, the more am I convinc-ed that, with careful investigation and clear thinking on our part, and cooperation on the part of the patients, we may achieve not a little in the alleviation of physical suffering and mental distress.

Discussion

(*After the paper was read on 26th May 1939.*)

Dr. P. V. Cherian:—Said that he preseribed nasal alkaline douches fo chronic rhinitis and other nasal conditions, but not in acute infections. He enquired why the speaker was against their employment.

Dr. M. Sanjiva Rao:—Considered that nasal alkaline washes were sometimes useful; he mentioned a case which had remained free from asthma for three years, merely by washing the nose with an alkaline solution. Another of his allergic cases was sensitive to particles of raw rice which were inhaled while pounding paddy. He had found in a few cases that, during or shortly after an asthmatic attack, one or both of the maxillary antra

showed opacity on transillumination, but recovered normal translucency between attacks.

Dr. E. V. Srinivasan:—Remarked that several allergic conditions occurred in ophthalmic practice,—especially eczematous lesions due to atropine allergy, spring catarrh, and lens allergy. In many of these cases he found a positive family-history. He thought that allergy was a doubtful disease. One of his cases was sensitive to white vaseline in 'plasma', but did not suffer from allergic manifestations if yellow vaseline was used instead. He asked whether the lecturer had employed the drug Afenil in allergic cases.

Dr. N. Srinivasan:—Wished to know the speaker's opinion regarding the use of snuff in allergic nasal conditions, patients often reported much benefit by the use of snuff.

Dr. G. P. Rayen:—Asked the speaker whether he considered sinusitis to be the cause of the allergic state, or whether it acted only as an exciting factor in patients who were predisposed to allergy by heredity. He mentioned that Iodides and thyroid were used in the treatment of allergy.

Dr. V. R. Kamath:—In reply, observed that he did not think nasal douching could do any positive good, while on the contrary it served to wash away the nasal mucus which was one of the most efficient antiseptics among the body-secretions. It was said that improper or careless use of nasal douches resulted in sinusitis and middle-ear infection, but he had not personally seen such cases. Proetz had described the remarkable increase in thickness of the nasal and sinus mucosa during allergic attacks, as evidenced by opacity of the sinuses in skiagrams taken at the time of attack or immediately after its subsidence. As regards sinusitis and allergy, the relationship depended upon the fact that bacterial protein, just like any other protein, could sensitise an individual and bring on the allergic state. A person with the allergy-producing Mendelian dormant in his heredity, was more likely to be sensitised by the bacteria in his sinuses (if they happened to be infected) than was a person with sinusitis but no allergic family.history, although the latter person could possibly get acquired allergy from his sinusitis. In other words, the hereditary allergic was not specially liable to sinusitis, but if he did have a sinusitis he was likely to be sensitised to the particular bacteria. A particular germ could cause any or all of the allergic conditions in the same individual; but, on the other hand, a particular individual was usually sensitive only to one particular germ (or other protein). That is why, by removing the antigen we could hope to cure allergy, though the patient with a hereditary predisposition could be sensitised by a different protein later. The speaker had not come across atropine-allergy, but would be on the lookout for such cases in the future. He did not know whether snuff could do any benefit in allergic nasal conditions, and he had no occasion to prohibit its use. He had not used Afenil in his practice.

Hysteria of Modern Times *

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HYSTERIA and neurasthenia are allied conditions. They both are regarded as of psychological origin, as different forms of bodily reaction to mental stress. They both show failure of adaptation to the difficulties of life. The hysteric reaction may be looked upon as one where the patient responds negatively, so that there results paralysis, anaesthesia, mutism, aphonia, amnesia, or loss of consciousness with or without convulsion. The mental state is one of placid acquiescence, in the condition that there is no distress about its presence. When a fit of hysteric convulsion comes on, the patient usually lies herself in a safe place without injuring herself, while in epileptic fit, the patient falls unconscious wherever she may be, and hurts herself even to the fatal end. The mind in hysteria remains in a state of subconsciousness.

The word hysteria was unknown in olden days, but since the advent of modern civilization this unknown disease has crept in the nomenclature of diseases. Perhaps it was due to the fact that, then, the ladies used to do the household work with their own hands and take live interest in their domestic affairs, and also that they used to keep good robust health and marry at proper mature age. They were also, then not addicted to the VICES, which are prevalent nowadays in the so-called civilised life. The modern girl nowadays wastes more of her time in her make-up, so as to look a decent upto-date civilised girl. She cares more for the tea parties, dinners and cinemas, than to devote her time for her household or other useful work. This state of affairs certainly tells on the sexual instinct of the girl and arouses her passions earlier at an immature-age, which, when not satisfied leads to diseases like hysteria. This disease is especially more common in the ladies of high and middle class families, and is unknown in the lower strata of society.

Important Predisposing Causes of Hysteria are : 1. That the husband is too old in age as compared to her, and is sexually weak ; thus there is always present incomplete unsatisfactory sexual relationship between them.

* Specially contributed to 'The Antiseptic'.

2. The weak financial position of her husband and his low position in the social scale while she regards herself as an uptodate educated society girl. He does not come to her expectations.

3. That the husband does not love her, nay, even ill-treats her, and does not allow her the full liberties,which she wants to enjoy as an educated modern girl in the house and outside in the social circle.

4. Chronic constipation. It is well to remember that a loaded rectum may also be the cause of a hysteric fit. Such nervous hysterical instability will remain obdurate to treatment, unless the simple but easily overlooked cause be removed.

Symptoms.—The disease indeed expresses itself even more frequently in forms which until we are familiar with its almost unlimited capacity for producing indefinite symptoms, are very difficult of recognition in olden days. Host of symptoms are relegated to this disease, but the important ones are:—

1. *Loss of speech*:—(Functional Aphasia) commonly and very authoritatively described as one of the stigmata of hysteria.

2. *Insensitiveness of Uvula and loss of knee jerk* :—If the finger is put in the throat and uvula touched, the hysteric lady does not feel ticklish or uneasy,while in a normal healthy throat, it produces a sense of uneasiness and tendency to vomiting.

3. *Hiccough*:—It is a common symptom of hysteria and is caused by a sudden more or less violent contraction of the diaphragm and may be produced by irritation from the nervous or functional reflex.

4. *Nausea and Vomiting*:—Although it occurs in hysteria, yet hysterical or functional manifestation should only be diagnosed when the other structural diseases are positively excluded.

5. *Defect in Eye-Sight*:—Caused by eye strain due to error of refraction. This should be removed by giving suitable glasses otherwise this eyestrain produces very unpleasant symptoms, as it taps the nerve. The autocrat of the breakfast table used to say that it is better to lose a pint of blood from the vein than to have a nerve tapped, as thus all the energy runs to waste and the whole Central Nervous System becomes exhausted in a pronou nced degree and may ultimately lead to neurasthenia and hysterical ebullition.

6. *Headache* :—Some people have endeavoured to aid in the discovery of the cause by mapping out certain cranial areas in which pain occurs and attaching to each area a particular disease. The one, which is mainly vertical is due to hysteria and anaemia, and the one, which is frontal is due to C. I. Disturbances, renal or ocular diseases, and the pain which is referred to the occipital area is due to intra-cranial mischief and spinal irritation.

7. *Hysterical Insomnia* with unconscious motivation.

8. *Hysterical Chorea and Clenching* of fists.

9. *Neuralgia*:—Is considered by some as a hysterical manifestation. This of course may be, though hyperaesthesia is less characteristic of hysteria than anaesthesia. Neuralgia frequently occurs in neurotic women and the cause lies somewhere else. The common site for such peripheral irritation is the ovarian region, and the examination of this region in neurotic women will reveal pain on pressure over one or both ovaries in which case the infinitely best drug is belladonna combined with phenazonum, along with the application of small blisters frequently repeated, in the region where the pain has been elicited.

How to Examine the Hysteric Patient.—In hysteria, the symptoms are but the prolongation of the ordinary emotional reactions occurring in every-day life. So,the aim of the physician is to understand the patient and to make her feel that he does understand her. He will then be in a position to make her see that her mode of reaction is a bad one : so, to accomplish it, it is essential that the doctor should listen to her, atleast to all what the patient has to tell him. She should also be asked about the regions and systems of the body which she has omitted to mention. Do enquire about the mental functions especially about the depression, the condition of the memory, the power of concentration, and about fears and anxieties. She should not be enquired in an angry and anxious tone ; if you do so, such a patient will acquire such symptoms in a few days unless she is satisfied that the questions are being asked in a series in an ordinary routine enquiry. She should not be asked why she failed to mention that particular symptom. Such patients are often mono-symptomatic, and the hysterical manifestations may have come on with dramatic suddenness. Her general attitude towards life now and formerly should also be enquired. The patient should be thoroughly examined to her entire satisfaction. No loss of confidence should follow your examination. Make her believe that you have understood her disease and that by your treatment she will be cured. To make the patient have faith in you, must be the end result of your examination; you must try to

win her assistance in understanding her mental and physical state of health, and then try to seek her co-operation in the treatment. If any organic disease is discovered, it should be told, and if it has any relation to the symptoms complained of, it should be admitted straightaway. Great harm usually results by attributing widespread or remote symptoms to nasal spurs, slight error of refraction, or displacement of uterus.

Treatment.—1. For the removal of gross hysterical manifestations and the alteration of hysterical tendency.

2. Treatment during Hysterical fit.

The first one is easy to achieve especially in uneducated and stupid patients. There are three methods of approach.—Suggestion, Explanation, and Psychological Analysis.

Suggestion may be direct or indirect. (1) Direct suggestion without explanation may be practised while the patient is in a hypnotic state:—The patient is told that she can move and that she will be able to do so on awakening. This will produce the required effect on her. (2) The two indirect methods of most value,are Weir Mitchell system and Electricity. The first method depends upon complete isolation, over-feeding, absolute rest in bed and massage. Books and amusements are to be forbidden until definite improvements are visible. The suggestion that cure will follow the treatment is accepted. Electricity if chosen as a treatment should only be administered by the doctors. Both these methods may be used without explanation. The patient is simply promised cure, if she undergoes the treatment. In the past they have often been successful but they are not methods of choice because they do not teach the patient how to avoid relapse. It is much better to combine explanation with suggestion. The simple method of accomplishing this is to provide the patient with examples of the emotional reaction. Suppose she is suffering from loss of voice or inability to move any limb, then under the above treatment, if she is asked to make an effort, she will find that she will be able to move and talk. If the patient is carefully tackled and her confidence obtained, then this simple procedure will very often succeed, for the patient will be in a state of mind ready to accept the suggestion from a doctor, who has shown so much interest in her. The cure may take a few minutes or hours or may take a few sittings. The doctor should reinforce his suggestion by various devices; as for instance an application of ferradic current to show that the muscles which she was thinking had paralysed are working. If the loss of power

is due to contracture, *i. e.*, to over-action of muscles, she should be taught to relax. If the hand is closed, she should be taught to open it quietly. What I have generally found good in my practice is the following method of suggestion with explanation :—

On the very first day you see an hysteric patient, you examine her in such a polite and sympathetic way that she should be convinced that you are very much interested in her disease and thus she may automatically express her great faith in your treatment. If she is tackled in this way, she will not feel shy in telling you all about her disease and its symptoms. She should be enquired very softly (*a*) about her relations with her husband; (*b*) about the regulation of her periods; (*c*) and about any other additional matter which may be telling on her mind. When this stage is reached then try to convince her that she will be alright by your treatment, which should be as follows :—

1. Hypodermic injection of one c.c. of either pure distilled water or very slightly tinged with methylene blue. When injecting this fluid, ask her to see the process being done. She must also be impressed that the injected medicine is a very costly one and it will certainly rejuvenate her and cure her of the disease.

2. *Mythelene Blue* or 2 grains mixed with Soda bicarb 10 gr. in catchets or capsules twice a day. She should be gently explained that all the hysteric poison in her body will pass out in her urine and fæces, and that she should herself notice it being passed out, by seeing the change of colour of her excreta, (which will be naturally coloured blue due to methylene blue.

2. Put her on triple Valerianate Tablets three times a day, instead of Zinc Valerianate Mixture, which is very nauseating to take.

4. If she is weak and anæmic, give her good tonics and nourishing food. She should be advised to take long walks and take interest in her household matters and do the domestic work with her own hands.

5. Administration of *Garlic* is said to be good to hysteric patients. It is either given with food as raw vegetable, or in the form of tincture, *Tinct Allyl* minims 20 in water to be taken during meals twice a day. Its smell is also beneficial, hence it can be tied round the neck and wrists in a fashionable manner so that she may continually be having its smell.

6. If she is suffering from any other organic disease,it should be properly treated. Such cases generally suffer from Dysmenorrhœa or even Amenorrhœa.

Another better method of tackling such cases is by psychological analysis. The object in view is to find the exact circumstances physical as well as psychical which were associated with the onset of disease. This is a method which absorbs several sittings; and such sittings should not be on consecutive days. This analysis should not be exhaustive and be conducted in such a way that she should not consider herself as having been humiliated by it. One should try to find out with the help of the patient the very first emotional causes and the circumstances surrrounding them; thus the whole mystery will be cleared up. It will be found that the subsequent attacks come on, when something occurred which was associated with the original emotional cause and which would have brought this cause into conciousness. The whole idea is that the patient is made to review her own past history by considering its various aspects, and thus she is induced to see for herself that the illness rested in the past on a false foundation, and that another way of regarding her difficulties will in future keep her well.

Treatment during Hysteric Fit.—Allow the patient to remain where she is, and if that is unsuitable, then put her on bed and leave her alone in the room as such. It will prove effective. She will herself regain consciousness after sometime. The doctor should warn the relatives not to be afraid of any thing. The more one cares for such cases, the worse they become and in sympathetic circumstances, may even come out with more alarming hysterical symptoms. Neglect of such cases is the golden rule to follow. In cases of emergency, bring the hysteric patient around by sprinkling cold water on her face or applying any available smelling salt as sal volatile or ammonium carb or spt. ammon. aromat. It is better to apply such a medicine to one nostril only, while keeping the other closed with a finger. If no smelling salt is available, then one should make use of the smell of garlic or onion or any other scent available in the house. When she regains consciousness, give her spt. ammon. aromat in water and allow her to take some rest before she gets out of bed.

Advice to the Parents of Would-be Couple.—Marriage should be allowed to take place, when the boy and the girl have attained majority, and are in robust health. Nowadays, one

should particularly find out on medical authority or otherwise, if the boy is potent and sexually strong, because in these modern days it is alleged on undoubtable authorities that 95% of boys masturbate, and lose all their vital strength before their marriage. One writer even says that in a certain country 99·9% of boys masturbate and ·1%, who say no, are liars. So, it is the paramount and important duty of the guardians of boys and girls to make themselves satisfied that the boy is potent and the coming marriage won't be a failure. The eugenics society has issued a carefully prepared and admirable schedule, which couples, intending to marry may fill in for each other's confidential information under the doctor's supervision.

Relation of Sex to Hysteria.—It has definitely been found out that in females the unsatisfied sexual desire generally leads to hysteria, because her partner is either too old as compared to her or that he is sexually weak and does not fulfil her expectations; thus there is no love between them. Such disagreements affect the personality and therefore may affect the sexual functions which depend so much upon right relationship. Sex cannot find its full satisfaction except with love. Discord arises from this fact. The attitude of some husbands is, that sex is a Physiological necessity and they regard their wives as a receptacle for the discharge of their sexual needs, without caring for the finer sentiments of love and affection of their wives. The idea of simply satisfying one's own sexual passions, generally what is called animal gratification, without caring for the satisfaction of the other partner's passions, who had been worked into sexual excitement and then leaving her excitement in mid-air. This generally leads to disaffection, hatred and anger; leading ultimately to hysteria, because it has been held by psychopathologists that the arousal of sexual desire of a female without discharge and satisfaction in an orgasm, is liable to produce neurotic conditions, restlessness, anxiety, discontent, palpitation, strong and distressing feelings in the abdomen and other disorders of body and mind including impatience and hysteria. In fact, it is this condition, which originated the name of hysteria, the womb wandering in the body, like an animal seeking for satisfaction. A man should see that after the intercourse, her partner leaves the bed quite satisfied and with a sense of peace and lethargic pleasure.

Important Information for the New Couple.—(1) The right posture during the intercourse, is with the female in the

lithotomy position on the back, with the knees drawn up and the legs separate and not the position, when *Aposteriori* which is a natural position in animals and not in men, as it prevents complete embrace.

(2) The orgasm of husband and wife should correspond in time, at first it is difficult, but time and experience will set it right—the latter by more wooing on the part of the husband. Intercourse itself should be taken as a sacred duty, and not merely as a sort of animal gratification. It should be done at regular intervals, at least 4 or 5 hours after the full meal, and with the consent of the partner.

(3) *Use of Contraceptives*:—They are of various forms for both sexes, but their use should be avoided as far as possible, especially in the early days of one's married life, as their use produces bad effect on the health of the couple, especially of the female partner. Nowadays, the *Coitus Interrupticus* is practised by young men as a common form of contraceptive, but this is bad, as it produces anxiety neurosis which may later on become a precipitating cause of other hysteric manifestations.

(4) The physiological fear of intercourse in the minds of newly married couple, should be removed by tactful handling by the doctor. Impotency especially psychical, in the case of man and frigidity and vaginismus in the case of female, are only due to sheer inhibition, caused by fear and are usually of unconscious origin. Such minor psychological disorders can be put right by a little adjustment and consideration of the partner, aided by some advice from the doctor through suggestion and explanation and it is the duty of the doctor also, to provide the atmosphere of sympathy, respect and security in which the patient should begin to learn and accept the real sources of her symptoms and their treatment.

Simple living with high thinking and good physical exercise should be the maxim to be followed by every one who wants to lead a healthy and care-free life without the manifestation of such diseases.

Sulphanilamide Drugs in Modern Treatment*

BY

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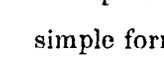
SINCE the discovery of Neosalvarsan by Ehrlich, perhaps the most significant advance in modern chemotherapy is the discovery of the Sulphanilamide group of drugs. Its advent is so recent that our knowledge of its use in the treatment of bacterial diseases cannot be said to be complete, though its usefulness against streptococcal infections has been established beyond doubt. It is the object of this article to bring together within its short compass the more important available information about these drugs for the benefit of the general practitioner. The first substance of this series was prepared in the Elberfeld Laboratories, Germany and a paper about its action on experimental streptococcal infection on mice was first published in 1935 by Domagk. It is named Prontosil Red and it is an azo-dye containing a Sulphonamide group. As it is sparingly soluble in water and therefore unsuitable for injection, a more complex compound Prontosil soluble was elaborated which is also an azo-dye with a sulphonamide group in common with the first Prontosil Red. Later it was discovered that the active element in these compounds was the Sulphonamide group in the para position. Since then para-Amino-benzyl Sulphonamide, with the comparatively simple formula $H_2 O_2 S$  NH_2, and named for shortness Sulphanilamide came to be the most commonly used substance of this series. Sulphanilamide is presented usually in tablets of 0·5 gm. with different trade names by different companies, namely Prontosil Album, Sulphonamide-P. Colsulanyde, Septanilum, Streptocide, etc., Proseptasine (May & Baker Ltd.) is a Benzyl derivative of Sulphanilamide.

Use in Streptococcal Diseases. The action of Sulphanilamide is most pronounced in diseases caused by hæmolytic streptococci though it is not limited to such diseases. Puerperal Septicæmia has been the most potent cause for maternal mortality, the

* Specially contributed to "The Antiseptic".

majority of cases being attributable to the Streptococcus Hæmolyticus. Since the advent of Sulphanilamide, the death rate due to this dreaded complication has shown a marked fall in those Maternity Hospitals where it has been systematically used.

Reports of its successful use in almost hopeless cases of streptococcal septicaemia are many and convincing. The author can recall especially one case of septicaemia with a swinging temperature reaching to over 105°, persistent vomiting, and severe dehydration, whose life was saved most dramatically by prontosil. The initial dose recommended in such severe cases is six tablets of sulphanilamide a day in three to six divided doses together with 10 to 20 c. cm. of Prontosil soluble given intramuscularly. As the fever subsides the injections should be gradually stopped and the dose of sulphanilamide reduced to three to four tables daily. This oral treatment must be continued for 4 to 7 days after the temperature has come down to normal, to prevent a relapse. In moderately severe cases, four tablets of sulphanilamide together with 10 c. cm. of Prontosil soluble a day may be given, while in mild cases oral administration alone with three to four tablets a day are sufficient. It should be mentioned here that the doses advocated by many western writers are too high to be safely administered to Indian patients. Reports of poisonous effects with sulphanilamide are practically confined to cases where such high doses have been given and where the treatment has been prolonged. The use of sulphanilamide as a routine prophylactic measure in obstetric cases is not advisable as it is not free from danger, but it is justified in cases where there has been much instrumental interference and where there is a known risk of sepsis (Colebrook 1937).

Streptococcal tonsillitis and Ludwig's angina; Meningitis, Pneumonia and Empyema of streptococcal origin: Erysepelas and Scarlet fever are other diseases for which successful results with sulphanilamide have been reported. Till now streptococcal meningitis was considered an invariably fatal disease. Therefore, reports of success in this disease with sulphanilamide, though necessarily limited to a few cases from the rarity of the disease, are all the more remarkable. Arnold (1937) treated successfully a female aged 28 years, suffering from Mastoiditis and streptococcal meningitis with intrathecal injection of a 0.8 percent sulphanilamide solution in normal saline.

But the necessity of the intrathecal route has not been established because sulphanilamide administered orally is found very soon in the cerebrospinal fluid in high concentration (1 in 5000)

and successes in streptococcal meningitis have also been recorded with the oral and intramuscular administration alone. Dosage of sulphanilamide for streptococcal diseases in general can be adapted from the rough scheme indicated earlier for puerperal septicaemia, according to the acuteness and severity of the injection. In passing, it should be pointed out that sulphanilamide has not been found to be active againt the streptococcus viridans and is therefore useless in the treatment of subacute bacterial endocarditis, rheumatic fever, and chronic diseases like fibrositis, arthritis etc, caused by focal infection with the Streptococcus viridans.

Use in Non-streptococcal diseases.—There is sufficient evidence to believe that sulphanilamide can be used with advantage in B. Coli infections of the Urinary tract, in Meningococcal meningitis, in gonorrhœa, and in gas gangrene. Its action on the pneumococcus is very doubtful, and on the staphylococcus practically negligible. The reports on B. Coli infections are confined mostly to acute infections of the pelvis of the kidney in children, and women in the peurperium, which are easily amenable to other methods of treatment. There seem to be few reports of its use in chronic B. Coli cystitis which is usually so difficult to eradicate. The author has treated three such cases with repeatedly positive culture results, in all three of which the urine was loaded with pus. In two, the bladder was atonic, secondary to spinal cord involvement and the third was a severe case of Typhoid complicated by B. Coli Cystitis. The urine was sterile and remained sterile from the 3rd week of treatment with sulphanilamide. Three to four tablets of sulphanilamide were given together with 10 c. cm. of Prontosil daily. The injections were stopped after the first week. In view of the recent spread of cerebrospinal fever in India, and its high mortality rate in spite of the use of the anti-meningococcus serum, sulphanilamide raises the hope that there may be a definite lowering of the percentage of deaths from the disease in India in the future. Probably because of the diverse manifestations of gonorrhœa in the body, varying degrees of success with sulphanilamide have been reported by different writers, but on the whole the reports are encouraging. Very recently, an allied compound called the Uleron brand of Diseptal has been put on the market by the manufacturers of the original Prontosil. This substance while being equally effective against streptococci is said to have a more specific action on the gonococcus and the

staphylococcus. There is not sufficient clinical evidence yet to prove this claim. Diseptal also shows promise of being able to modify the course of Abortus Undulant fever.

Toxic Effects and Precautions.—The toxic effects most commonly met with are Methæmoglobinæmia and sulphæmoglobinæmia. These manifest themselves clinically by the cyanosis which may develop rapidly. Spectroscopic examination of the blood is a more delicate test for these two conditions. Certain precautions must be taken in order to avoid these toxic effects. Magnesium sulphate and purgatives which cause watery motions and thus increase bacterical growth and H_2S formation and absorption in the bowels, should be avoided. Any drug like liquorice or food-stuffs like eggs, which contain sulphur should be avoided. Other substances to be avoided are Phenacetin and acetanilide, phenazone and amidopyrine, sulphonal and melthyl sulphonal. High doses of 12 to 14 grams of sulphanilamide per day may result in methæmoglobinæmia. The same may result by the accumulation of the drugs when they are pushed in patients with impaired renal function. In general, no patient should be given more than 28 grains in one continuous course of treatment. In the treatment of these two conditions once they develop, oxygen is of value in methæmoglobinæmia, but blood-transfusion is necessary for sulphæmoglobinæmia.

Agranulocytosis is a very rare complication, but one case of death from this cause has been reported by Young, 1937.

This patient received within the course of 18 days a total of 54 gms. of sulphanilamide. Other toxic effects that may arise are nausea, colicky pain in the abdomen, acidosis, hæmolytic anæmia, drug pyrexia, and cutaneous rashes. Four cases of hæmolytic anæmia have been reported possibly resulting from the drug (Harvey and Janeway, 1937), which recovered after transfusion with citrated blood. In view of its great potency against bacteria on the one side, and the possibility of toxic effects on the other, it is well to sound a note of warning against the neglect of certain rules which have been laid down here, both as regards the dosage and length of treatment, and the drugs and food stuffs to be avoided during or immediately before treatment with sulphanilamide. Such a warning detracts in no way from the merits of the drug.

Sulphanilamide marks the first real advance in the fight against bacterial diseases as distinct from protozoal diseases and there is every possibility that this may lead to the discovery of newer compounds with a still wider range of usefulness against bacteria. One such new compound Diseptal has been mentioned. The wide range of its usefulness may itself tempt the practitioners to use it indiscriminately in all acute infections of known as well as undiagnosed ætiology. Such unscientific experimentation can bring only disillusion to the practitioner, and undeserved disrepute to a valuable drug which is saving many human lives.

Summary.—1. The dosages for a combined administration of Sulphanilamide tablets orally and prontosil soluble injections I.M., are indicated for use in severe, moderately severe and mild cases of streptococcal septicæmia, and for other streptococcal diseases.

2. Sulphanilamide can be used with advantage in non-streptococcal diseases *e.g.*, B. coli infections of the urinary tract, Gonorrhœa, Meningo-coccal meningitis and gas gangrene. Cases of chronic B. coli cystitis are reported to have responded well.

3. The common toxic effects such as methæmoglobinæmia, sulphæmoglobinæmia, agranulocytosis, colicky pain in the abdomen, acidosis, drug pyrexia, cutaneous rash, etc. and the prevention and treatment of a few of these, have been mentioned.—*Editor.*

Piles or Hæmorrhoids*

BY

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Definition.—A Pile or a Hæmorrhoid is a vascular swelling of the rectum or anus composed of varicose or thrombosed veins of the superior or inferior Hæmorrhoidal system. It is found surrounding the anus and the lower inch or two of the rectum. The middle Hæmorrhoidal veins draining as they do the outer surface of the rectum and the upper surface of the Levator Ani muscles, do not enter in the formation of Piles.

Predisposing Causes.—The character of the blood supply of this portion of the bowel and the condition under which it is carried on, go far to explain the frequency of this affection. The blood vessels in the rectum run in longitudinal series along the bowel being connected by transverse branches which form a plexus around and just above the anus. This situation in the loose submucous tissue where there is but little support necessarily exposes them to great and sudden variation of pressure before

* Specially contributed to "The Antiseptic".

and after defæcation. Their dependant position at the lowest part of the portal area, together with the absence of valves and the fact that they constitute an important communication between the portal and systemic circulation—affording the chief means of escape from a block on the portal trunk—all these reasons may be looked on as predisposing causes of the condition. In addition to these, there are :—

(1) Sedentary occupation.
(2) Alcoholic excess.
(3) Too luxurious, rich, stimulating, indigestible constipating diet.
(4) Chronic constipation leading to congestion of liver. This is the common fore-runner of Piles. A more common cause, than constipation is, however, the attempt to cure it by purgatives. Excessive and unusual straining and irritation resulting in such stools are responsible for a greater number of cases than constipation itself.

It is the Disease of Rich Men—*Varieties* :—Two chief varieties are described as under :—(1) External Piles. (2) Internal Piles.

1. *External Piles* :—are found at the margin of the anus and are covered by skin.

2. *Internal Piles* : —are limited to the lower inch or two of the bowels and may present very varied appearance in different cases.

The dilated veins are held by a certain amount of connective tissue and are covered by mucous membrane. At first they are quite soft and compressible and easily emptied on pressure but when they have existed for sometime,the connective tissue may be increased in amount and arterial twigs are often found running into the mass.

Symptoms.—The cardinal symptoms of piles are :—(1) Pruritis and some irritation before and after defæcation in the case of external piles unless it becomes inflamed from local irritation and cold. (2) Bleeding. (3) Pain. (4) Prolapse. (5) Sense of fulness in the rectum even after defæcation. (6) Presence of mucous discharge. (7) Anæmia.

Consequences of the Untreated Piles.—(1) Nervous depression from constant irritation and loss of blood. (2) Anæmia. (3) Reflex irritation in the sexual area which leads to sexual desire in men, and to bearing pains along the uterine ligaments in women. (4) Constant irritation leading to cancer. It is in fact an invitation to Cancer.

Treatment.—The treatment of external Piles when uninflamed is very simple. Constipation must be relieved by mild aperients such as confection Senna and Sulphur, Paraffin liquid, Agarol, Castor Oil, Extract Glycerrhiza Liquid. The parts should be kept clean and Ung Witch Hazel to be applied locally. Great care to be taken to avoid irritation to the anus. It is but rarely that operative measures are required. If it is considered necessary, it can be accomplished by grasping the piles with forceps and snipping them away by a pair of scissors in a direction radiating from the centre of the anus; the wound so caused should be sutured.

For inflamed and thrombosed piles, the patient should be kept in bed, the bowels to be opened by copious warm enemas and fomentation applied. If the pain and tension are very great, the pile should be incised and the clot turned out, the margins of the fold may then be cut and the wound dressed.

Treatment of Internal Piles.—The treatment is both General and Local. Local treatment in the earlier stage consists in the palliative measures which consist in the adoption first of such measures as will tend to prevent the further developement of these tumours and lessen the chances of future complications; secondly of such measures as will relieve the subjective and objective symptoms already existing. These are: (1) Remove all possible sources of venous congestion. (2) Regulate the bowels and assist the function of liver. For constipation, use mild aperients and small hot enemas after defaecation. Drastic drugs such as Aloes should be avoided. Moderation in eating and drinking is advisable. Suitable exercise is enjoined. When dependant on the pressure of gravid Uterus, little can be done beyond attending to the regular action of the bowels until delivery takes place. When protrusion takes place, the mass should be sponged with cold water and gently returned. For bleeding, injection of Hazeline Lotion (1 in 8) is useful or application of Ung : gallae cum opio. The injection of half an ounce of Olive oil in the rectum at bed time may lessen the tendency to protrusion when the bowels are moved in the morning. A suppository containing 3 drops of Ichthyol and 20 grains of Cocoa butter inserted at night answers the same purpose. Standing in cold water (so that the water reaches upto the level of Navel)

for 5 minutes daily is very useful by giving tone to the muscles and mucosa of the rectal area. When strangulation takes place, a wet boric lotion dressing may be applied and a hot water bottle placed over the dressing will keep it warm and give the patient considerable comfort. The cold in the form of an ice bag should not be permitted, since severe sloughing of the parts is apt to result. Divulsion of the Sphincter under an anesthetic will act like magic to relieve the pain and reduce the inflammation.

Again, Prolapse of the Hæmorrhoidal nodules by continued pressure obtained by means of Bier's Suction Cup is recommended by some. Boas' method of artificially inducing extra-anal incarceration of Hæmorrhoids is a very promising improvement on operative measures. Patient is urged to refrain from returning the mass to the bowels, to apply opiates or cocaine ointment to relieve the tenesmus and local dressings of Aluminum acetate to relieve pain. The nodules will shrink up and are not longer than a lentil, in 8 to 15 days.

Operative Treatment.—All operations so far devised for the treatment of Hæmorrohoid are well known to the surgeons. I need not go into details. Each method had been selected according to the merits of the case and according to the ability of the operator to perform the same.

As a rule, every operator obtains the best average results by employing the method in which he is most skilled. These operations devised from time to time can be placed into one of 5 classes :—

1. *The Injection Treatment*:—This method for the treatment of internal piles alone was employed first by Dr. Mitchel of Clinton III in 1871.

Since then, many imitators,both regular and irregular, have devised innumerable modifications both in technique and the injection stuff. In 1893, Dr. Robert W. Martin used 50% dilution of the original French Phenol. It displaced all other forms of solution. This injection treatment is employed in those cases where a more radical form of operation has been refused or where it is not desirable to confine the patient to bed on account of poor health or old age.

I used 5% solution of carbolic acid in Glycerine with very good results.

The cases especially suited for injection method are :—
(*a*) Markedly Anæmic (*b*) Tuberculous subjects (*c*) Where organic disease contra-indicates anæsthesia. (*d*) Bleeders.

2. *Crushing Operation*:—The aim of this operation was to cause sloughing of the pile. It is a very painful and risky operation if proper asepsis is not maintained. I have seen cases which developed tetanus and secondary hæmorrhages. It is practically given up now.

3. *Clamp and Cautery*:—This method of treatment was introduced by the late Mr. Henry Smith and is now seldom used. The scar tissue developed or adhesion of the raw surfaces caused in many cases stricture of the gut and narrowing of the anal ring. The premature separation of the scab sometimes caused alarming hæmorrhage.

4. *Ligature Operation*:—This method has many warm admirers and ardent followers like Mr. Allingham of London and of Dr. Mathews of Philadelphia. It is an operation much in vogue and if carried out with due antiseptic precautions is very successful and is far superior to the Clamp and Cautery operation. In the hands of an average operator this method has produced radical results and has been followed by few unpleasant sequelæ—like stricture of the gut or secondary hæmorrhage for an early tearing off of the pedicle, failing to secure primary union, skin tabs frequently remaining for subsequent removal. The duration of the healing period is not shortened because of the sloughing of the ligatures from either the skin ring or the pedicle before union takes place leaving the wound to heal by granulation.

5. *Excision* :—Is done when the hæmorrhoidal condition is general and where both internal and external piles are present. This operation is known as Whitehead Operation. This operation is most effective, the least painful and the safest. It consists of total removal of pile bearing mucous membrane and sub-mucosa in cuff fashion. But I have seen even in the hands of good surgeons, copious bleeding and if certain precautions such as including the sphincter in the muco-cutaneous stitching are not taken, there is incontinence of fæces and all sphincter action is gone (I met such cases in my 32 years' practice.)

There is another operation much in vogue suitable in the same way as Whitehead Operation but almost blood-less and less liable to complication. After dilatation of the sphincter, a silk suture is passed at junction of the skin with mucosa in the midperineal line at the top and one on either side of the anus. When traction is made on all the three sutures, the circular shape of the anus is changed into a triangle and the piles are divided on the sides of the triangle which are dealt with one by

one. Clamp one side. Two Hagedarn needles are threaded at either end of a silk suture. The first stitch is placed at the apex of the triangle and tied at the centre of the thread. The clamp being removed, the two needles are passed through from opposite sides at the same points. Each stitch is pulled tight and not tied. The suture is continued at $\frac{1}{4}$" intervals until the lower end of this side of the triangle is reached where it is tied. The redundant tissue is clipped away above the sutures and the narrow ridge thus left is touched with thermocautery or Paquelin cautery or electro cautery. The other two sides of the triangle are similarly treated. The three silk sutures are removed and wound dressed with sterilized olive oil. An India rubber tube is inserted to let wind pass and thus make the patient comfortable. Another modification of the operation in practice is to use a specially made long curved clamp forceps to clamp sides of the triangle separately and clipping of the redundant tissue over the forceps and then passing one threaded needle in the tissue and over the forceps. When lower end is reached, the clamp forceps is removed and the continuous suture is pulled and tied on either end. This will present a stitched appearance. In this method too, if sepsis takes place and stitches are loosened, there is danger of secondary hæmorrhage.

As a modification of this kind of suturing, I have devised another kind of suture :—All the procedure is the same. After holding one side of the triangle in long artery forceps, I start stitching from the lower end of the side of the triangle with specially made needle, the sharp end of which is like crucia needle ; passing the needle through I pull up the thread on the opposite side of the forceps and start continuous stitching at an interval of $\frac{1}{6}$", passing needle pulling up the thread loop and passing the end of the thread in the right side of the loop and pulling back the left hand side of the knot tightly and thus going on stitching till the upper apex is reached where knot is tied and the thread is cut off. The other two sides of the triangle if they have the piles should be similarly treated and the wound dressed aseptically.

This method has given me most successful results and I have treated over a thousand cases by this method in my 32 years of practice and none came back with any complaint. It is absolutely bloodless, painless, and less liable to any complication. The time taken to heal is much shorter. There has been no discomfort to my patients. They can walk, eat anything they like, bowels move daily with no pain or untoward effect on the operated area which is atonce cleaned and dressed after defæcation. Cases are discharged on the 12th day.

CASES AND COMMENTS

Cyclic Diarrhœa of Infants

BY

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UNDER the above head,a few ideas are recorded below,relating to a form of diarrhoea which is periodic in occurrence and more or less benign in its course.

Illustrative Cases.—1. Baby Seenu—8 months—male—middle class Brahmin—breastfed and not weaned. Appears in ideal nutrition but for slight scorbutic beading of ribs. *Had once flexural eczema.* Mother suffers from migraine.

The child gets loose motions for no apparent reason, and the bout repeats at intervals of three weeks from the sixth month onward. The motion is pale, semi-solid and foul. The attack lasts generally a week at the most and is not materially altered by treatment during the early half of its duration.

2. Baby c/o. Dr. R. V. C.—8 months—female—middleclass Non-Brahmin. Brought up on cow's milk from the beginning. Appears healthy during intervals. Mother is an asthmatic.

The child suffered from two bouts of diarrhoea with a healthy interval of one month.

3. Baby Leila—2 years—female—middle-class. Brahmin. Weaned at 1 year and now takes mixed diet. Paternal side is migrainous and maternal grandfather is an asthmatic.

The child has been having periodic diarrhoea from the age of 1 year. Three attacks were observed by the writer.

4. Baby Sundaramma—1 year — female — middle-class-Brahmin—father migrainous. Weaned at 9th month.

The child has attacks of diarrhoea for no apparent reason.

5. Baby Krishnamurthi—$2\frac{1}{2}$ years—male (Brother of No. 4.) Takes mixed diet.

This case has been watched by the writer during the attacks of diarrhoea six times.

Two children in this family died of infantile biliary cirrhosis.

6. Baby—9 months c/o of Mr. V. R.—Fed on Allenbury's and breast milk — Middle-class-Brahmin — Father formerly migrainous and now a diabetic.

Ætiological Factors.—The following points emerge from a close study of the above six cases and a few others not recorded here.

Predisposing factors:—These seem to be identical with those behind migraine or asthma or in other words, the periodic syndrome. Either hepatic insufficiency, or endocrine upset, or allergic diathesis seem to be the basis of the pathological picture.

Clinical Condition.—It is very difficult to differentiate the form of diarrhœa in question, and it is only after observing the child as a family physician it is possible to be sure of the diagnosis.

The general condition is not much perturbed. Rarely the temperature rises to 100° F. In severe cases the child lies in bed helpless and with signs of moderate dehydration.

When infection supervenes the case changes at once to a different clinical entity that does not call for description here.

Diagnosis—Diarrhœa is customarily classified as dietetic, infective, and parenteral. Cases not conforming to the above types challenge attention and enquiry in such cases generally reveals that the family members suffer from poriodic syndrome or eczema-asthma-prurigo syndrome, and that the child has been getting similar bouts of *rather innocent* diarrhœa. Till the patient rallies round completely and is watched on similar occasions later on, one cannot be sure of the diagnosis.

Prognosis.—Periodic diarrhœa by itself seems to be rarely fatal. A few of the neglected cases have been observed by the writer to run to hepatic cirrhosis or a marasmic condition. When enteral infection supervenes, infective diarrhœa sets in leading sometimes to fatal results.

Pathology.—Any discussion about the pathology is purely speculative and hence may not be quite complete or altogether correct.

In children any infection like a sore-throat or a latent mastoiditis may set up a parenteral diarrhœa which may be easily mistaken for cyclic diarrhœa. While "Cyclic Diarrhœa" does exist, the diagnosis generally has got to be verified very carefully in every case.

Under "conditions allied to cyclic vomiting", Sheldon writes, "The recurrent breakdown of fat metabolism which is the underlying factor in producing cyclic vomiting may find other clinical expressions, for instance, recurrent bouts of diarrhœa with the passage of loose pale offensive motions may occur and a good response to treatment is not likely to come about until the diet has been modified in the direction of curtailing the fats and increasing the intake of sugars."

An assumption appealing to the writer is the following:—Depending on an adreno-cortical insufficiency, some exciting factor as yet not properly elucidated, takes the infant to the clinical condition of "Cyclic Diarrhœa". In support of the above assumption may be remembered a few salient points regarding the adrenal cortex. Discussing the development of the adrenal glands, Boyd writes: "The fœtal cortex is different from the cortex after birth and is arranged in sheets instead of columns. Immediately after birth, a strange change takes place. The entire fœtal cortex rapidly degenerates and is slowly replaced by adult cortex and medulla, but is not until the twelfth year that the original size of the adrenal gland at birth is regained. The cortex is not entirely of the adult type until the end of the first year." Verzer thinks of coeliac disease (a disease characterised by fatty stools) in terms of adreno-cortical deficiency and this theory has been recently quoted by Prof. L. G. Parsons in one of his lectures (Lancet, 6th August 38). W. N. Kemp writes: "Severe diarrhœa is an invariable sequel of complete adrenalectomy in dogs. May it not be possible that in some cases of diarrohœa in infants, insufficiency of cortico-adrenal function may be the ætiological factor?"

Treatment.—Rest in bed with quiet surroundings is ensured. Fat is cut down in the diet of bottle-fed babies. Spoonfuls of sterile saline or water are allowed for the thirst.

The ideal treatment of administering adrenal cortex itself was not resorted to in the six cases cited in the beginning of this paper.

Vitamin C, either by itself (Redoxon) or as orange juice (2 ounces four to eight times in the day), is given. Vitamin C is specially chosen so that it not only tones up the adrenal cortex but also safeguards against the evils of an *allergic diathesis* that these little patients seem to be inheriting.

Also a recipe containing Bismuth Salicylas and Calcii Lactas is given (dose: gr. 1 per year).

From theoretical considerations, prevention of the disease consists in correct infant feeding i.e., with breast feeding wherever possible and with acid-milks when bottle-feeding is resorted to. Ample vitamin C must be provided as also optimal quantities of Vitamins A, B, and D.

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An Obstinate Case of Hiccough

BY

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HICCOUGH is not a disease by itself but a local symptom of a gastric disorder and it is caused by a spasm of the diaphragm which occurs at irregular intervals and sometimes at the moment of closure of the glottic aperture. It is a very common ailment and we meet it in everyday practice. We know, it can be cured by any anti-spasmodic remedy and it is not an alarming disease. But sometimes all gun-shot remedies fail in such a simple disease and we have to leave it to the course of nature. I am describing below a case of obstinate hiccough wherein I myself was the patient and in spite of all the remedies, it persisted for eight days and stopped all of a sudden.

Previous History.—I had a similar attack in 1926 and it lasted for 3 days and was stopped by an injection of Hyoscine Hydrobromide. I had a mild attack of coryza on 2-1-1939. I had no temperature, no cough; but only running of the nose. Bowels were clear. I put some drops of the Eucalyptus oil on the handkerchief and inhaled for a few minutes every day. On 5-1-1939, all on a sudden, the hiccough started. I got the attack after 13 years.

5-1-1939. I took the mixture of Bromide Tr. Hyoscyamus and Veramon tablet at night. I got sleep for two hours and when I woke up it started again. I did not get good sleep.

6-1-1939. Bowels were clear in the morning as usual, still I took soap water enema. Internally, I took oil cajuput on sugar, Benzyl Benzoate mixture, but I had no relief. I took Octinum drops also. I tried a smoke of Methi (a country recipe). It stopped for half an hour or so and again it started. At night I took H. M. C. Injection and I got good sleep the whole night but when I woke up it started again. I had a patient of hiccough who got no relief by any mixture or morphia infection but got relief by simply inhaling Amyl Nitrite capsules. So I tried this, and it stopped for a time, but again it started. I tried again Methi smoke and Benzyl Benzoate mixture but to no effect.

7-1-1939. At about 2 P.M. I took Hyoscine Hydrobromide Injection, as this injection had given me relief 13 years back when I had the same trouble. But this time it did not give me complete relief. It stopped for 2-3 hours and again it started at about 5 P.M. I took again an Enema of Turpentine and soap water but had no relief. It was continuous. At 8 P.M. I took an injection of Sodium Luminal (Bayers') but up to 12 P.M., I had no sleep at all. I have stopped severe hysterical convulsions by inducing sleep by this injection but unfortunately, I got no sleep

at all and it was continuous. At 12 P.M. I called my professional brother and he gave me an injection of H. M. C. again and I had good sleep till morning.

8-1-1939. When I got up it started again. It was nearly 3 days and it was resistant to all treatment. So, I requested my colleagues to give me whiffs of chloroform, though they were unwilling. No other man would have gone in for chloroform for such simple disease, but being myself a medical man and tired of all the remedies, I jumped up to it. I took deep chloroform at about 12 A.M. and also requested my colleagues to give morphine and atropine injections to have a complete relaxation of the muscles and a sedative action. I had sleep up to 4 P.M. and there was no trouble up to 7 P.M. But again it started. Again a senior practitioner was consulted and he gave me calbisma powders, adrenalin by mouth and Chloretone capsules but to no effect. Then Adrenalin Injection (Parke Davis) was given at 10 P.M. and Sodium Luminal Injection was given again at 12 P.M. To my surprise I had no sleep at all up to 2-30 A.M. and my friends had to resort again to the blessed remedy *Morphia*. From 12 to 2-30 A.M. the hiccough was continuous and troublesome. The respirations used to stop for a second, the diaphragm used to remian at a stand-still and a choking sensation was created. Moreover, there were little cramps in heart area. Whatever liquid was taken inside was vomited out. So my friends decided to give me morphia to put me to sleep. The morphia only proved to be a gun-shot remedy for some time. I got good sleep till morning but it started again at about 8 A.M.

9-1-1939. Now all the remedies were tried. All the anti-spasmodic remedies proved unsuccessful. The remedy once tried proved useless next time. A spray of Ethyl chloride on the pit of the stomach stopped it for 15 minutes. But when again it was given, it was of no use. The king of the Anti-spasmodics—Chloroform—could not give me complete relief. All were in a puzzle as to what treatment should be given. All my colleagues decided to give me stomach wash. At about 2 P.M. stomach wash with Soda Bicarb was given. 25 c.c. Intravenous glucose (Merck's) 25% was given to maintain strength. Nothing remained in the stomach. Everything was vomited. Till 8 P.M. I was alright and again it started. I decided to go to POONA for consultation. At 9 P.M. I left for Poona by train with one of my Doctor friends. I had to take morphia again in the train at about 2 A.M. and I had good sleep till I was awakened at POONA in the morning.

10-1-1939. It started again. Another consultant was brought and he advised Intravenous glucose, atropine sulphate 1/150 grs. Injection TDS with morphia at night. Bellergal Tablets, Burnt alum. The Hiccough continued the whole day and was calmed down by morphia at night.

11-1-1939. Again it started in the morning. Readers,

you can just imagine how all the remedies fail sometimes. The same treatment was continued with nitroglycerine Tablets and Bismuth chloretone mixture. Though the Hiccough was not continuous, it troubled me at intervals. I had to take morphia again at night.

12-1-1939. It was stopped for 5-6 hours in the morning but again it started. Another friend of mine came and suggested to take camphor-in-oil injection 6 grs. TDS. In addition to the former treatment, camphor-in-oil was advised as a Nervous sedative. I was tired of these injections, but I could not help; I had to yield. At night I took camphor-in-oil 6 grs.+atropine sulph. 1/150 gr. injection. (Camphor-in-oil and atropine sulph. injection were mixed.) At about 12 P.M. there was severe vomiting and the Hiccough stopped completely and since then I have no trouble at all.

Discussion.—I have treated cases of Hiccough with ordinary anti-spasmodic remedies and I hope many of my
have treated this disease with ordinary remedies.
in my case, Amyl. nitrate, Sodium Luminal and
form should fail. The other remedies like fo
traction of the tongue forcibly, abdominal b
plaster, mustard seeds internally were tried bu
effective temporarily. Some said it might be du
of Eucalyptus oil. But this is not the first time
cold. Many a time I have used it and so many p
cold. We give it internally for Typhoid fever
results have been noticed as yet. However, I kn
mine who got an attack of Asthma after taking i
drops of this oil in sugar for indigestion. He was h
no history of asthma. It was his first attack. Ca
be due to this alone? Some said it might be due to
Pleurisy. But there was no pain, no tempera
nothing. I got myself screened later on, but fou
normal. Some said it might be due to roundwo
complaint of any digestive system or any other
ever, I took santonine after a month or so and I p
worm and that too on the 2nd day. In screening
ragm, everything was normal. No cause of this obs
can as yet be found and I don't know, by what e
was stopped. It is still a puzzle to me and my fri

Will any reader of this magazine throw light
to how and why it started and how it was stoppe

Lastly, I cannot conclude this article wit
heartily, all my professional brothers in Na
who treated me very sincerely and who l
unturned to give me relief from this troublesom
stopped exactly on the 8th day.

The Antiseptic

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EDITORIAL

Modern Principles of Treatment In Bronchiectasis

THE treatment of Bronchiectasis has provided for many years, a baffling problem in therapeusis and only comparatively recently, has a determined attempt been made to obtain a satisfactory solution. The literature up till now lacked any large series of cases which have been followed up for a considerable number of years. Dr. Tudor Edwards in the Harveian Lecture delivered before the Harveian Society and reported in the pages of our distinguished contemporary, 'The British Medical Journal', discusses modern principles in the treatment of this disease based upon 199 cases treated by Lobectomy or Total Pneumonectomy.

The medical care of bronchiectasis, until recently, consisted of the use of expectorants such as Potassium Iodide, the administration of creosote by the mouth or the induction of cough by the inhalation of creosote vapours and the treatment of complications such as recurrent attacks of hæmorrhage and pneumonia, by bed rest and careful nursing. More recently, considerable benefit has been derived by the use of gravity to aid evacuation of retained secretions—postural drainage. This treatment is most valuable and effective.

Dr. Tudor Edwards in his excellent article, from which we have quoted extensively, indicates the gradual evolution of

modern surgical treatment and attempts to assess the position at the moment and the expectation of the future.

Bronchiectasis has been considered to be a medical subject. Sporadic attempts at a surgical solution have been made since the beginning of this century, if not before. Surgeons, however, have had their rebuffs. Technical difficulties of extirpation and the high mortality have necessitated reviews of the various procedures and have from time to time caused a return to measures directed to compression of the bronchial tubes.

The use of artificial pneumothorax is still advocated by some physicians. Bronchograms, carried out even when the lung is well compressed, show the dilatations still present and often unaffected in size or shape. The rigid sclerotic dilatations are impossible to compress and experience of workers has shown that artificial pneumothorax is unsatisfactory in established bronchiectasis.

Phrenicectomy and Thoracoplasty have been tried. The object of both these measures is, by compression of the lung, to keep the cavities empty and prevent retention of secretions. With lessened retention, the secretions become thinner and a certain amount of the subacute inflammatory changes in the bronchial wall may resolve and the tubes may become compressible after a period of time. The value of paralysis of the diaphragm in bronchiectasis has been widely debated. It is quite possible that further stagnation and difficulty in expectoration will occur and death result after phrenicectomy, the patient drowning in his own bronchial secretions. In some cases, however, improvement has resulted, probably due to the alteration in the direction of the basal bronchi from a vertical to a more horizontal position by the rise in the diaphragm.

Thoracoplasty entails removal of large segments of most of the ribs on the affected side and has the same object of approximation of the bronchial walls. Where the disease is unilateral, it has, in many cases, resulted in great improvement. Where the disease is localised, it would appear that the pulmonary collapse produced by the operation often occurs at the expense of normal tissue. Because of the presence of bronchial mucosa in the dilated tubes, adhesions of walls of the cavities in bronchiectasis, even if they can be approximated by pressure from without, will not take place as do the walls of tuberculous and pyogenic cavities. This explains the large number of failures from all forms of compression treatment.

In all these measures, can a cure be claimed in the strict sense of the word ? There may be improvement. Recrudescence

may recur as the result of super-imposed infection from upper air passages. Serious complications such as pneumonia, cerebral abscess, empyema are always possible. The diseased tissue is still present. Perhaps the inflammatory changes are less obvious. To solve this, attempts have been made to find a safe technique for the removal of diseased tissue.

Various attempts at Lobectomy have been done. Lilienthal, Graham, Sauerbruch and his associates, Brunn, have all submitted reports claiming good results with different technique. In England, the first case was reported by Dr. Tudor Edwards in 1929. Roberts and Nelson and later Tudor Edwards and Price Thomas have done several lobectomies. Since the use of radio-opaque oil was devised, the diagnosis of bronchiectasis has been simple. In the earlier days, only lower lobes were filled and wrong impressions were obtained and evidences of the disease in the upper and middle lobes were missed. As a result the method of lateral in addition to an antero-posterior bronchogram and independent filling of bronchi of each lung at intervals of one to four weeks, were evolved.

Lobectomy is not without dangers. But excepting the risks of the operation itself, all the subsequent complications of lobectomy are the result of sepsis. They include suppurative pericarditis, cerebral abscess, secondary hæmorrhage and suppurative pneumonitis. Suppurative pericarditis is a rare but dangerous and fatal complication. Secondary hæmorrhage is also rare. Suppurative pneumonitis is the most serious complication and has been largely responsible for post-operative mortality. Surgical opinion has veered round in favour of the need for pre-operative upper lobe adhesions and various methods have been described for bringing about this adhesion, a detailed account of which can be obtained by a perusal of the excellent article mentioned above.

What should be the criteria for this operation. Dr. Tudor Edwards discusses them under the following heads :—Firstly, the factor of infection should be of predominant importance in arriving at a decision. The second factor that should influence the decision is the extent and distribution of the disease. The third consideration is the age of the patient. Fourthly, there are the obvious considerations applicable to any major operation such as the absence of other gross disease which, in itself, constitutes a risk to the patient's life. The indications may be summed up by stating that patients between 4 and 40 with bronchiectasis which is reasonably localised and infected and in whom there

are no serious general contra-indications, should be considered as candidates for radical excision of the portion of lung affected.

Early results of the operation gave interesting data. Out of 166 cases done, only 20 died, the largest mortality being in the 40-50 years group. Late results also gave interesting data. 78 of these were symptom-free and 27 were definitely better.

Total pneumonectomy has also been advocated for bronchiectasis. The mortality is necessarily high but patients who recover are said to be able to carry on a normal existence. Compensation takes place through hypertrophy of the remaining lung. The mortality rate was 21 per cent. As to late results, nineteen patients out of the thirty three who were operated, are symptomless and working.

Dr. Tudor Edwards has certainly shown that satisfactory results can be obtained by lobectomy and pneumonectomy in the treatment of Bronchiectasis. There is no doubt that these provide the greatest advance of the treatment of a disease so chronic, so troublesome and so fatal as Bronchiectasis. We are sure that if the disease is treated in its early stages,the mortality will be negligible and the proportion of cures will be very high.

SPECIAL ARTICLE

Obesity

BY

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OBESITY is defined as a disorder of metabolism characterised by excessive deposit of fat in the body. It is also known as Adiposity or Corpulency.

Corpulence, an overgrowth of bodily fat, an "oil-dropsy" as Byron termed it, is a common condition which may be a source of bodily and mental distress. The word Obesity is derived from the Latin Obesus (*ob*—intense and *esum*—to eat), which stresses only one aspect of the question, namely, overeating as a cause of the condition and does not cover the whole field of the ætiology. There are a number of factors to consider. Certain races are more prone to become fat than others, *e. g.*, the Dutch, South Germans, South Italians, Maltese, Hebrews, natives of India and Ceylon, and some African races. A clear history of heredity is obtained by Futcher in 60% of his cases. Obesity

may develop at any age, but it is more likely to occur at certain ages, in babies, in children at puberty, in men after the age of 40, and in women during pregnancy or after the menopause. It is commoner among females than males. Simple obesity is due to disproportion between the food intake and the bodily activity. In these cases the basal metabolism is normal. Alcohol may play an important role especially malt-liquors. Now-a-days,it has been recognised more and more that this condition is due to altered secretions of the endocrine glands. The influence of the Gonads is seen in the increased fat in the eunuchs, castrated animals, and in some women during pregnancy and after the menopause and in girls during puberty. The influence of the thyroid is seen in hypothyroidism. In the obesity of hypothyroidism, the patients have a round fat face (moon face) and a fat neck. The pituitary gland apparently has less influence than we formerly thought. In cases of this kind, the fat is regionally distributed in the hips and thighs instead of being uniformly spread throughout the body as in simple obesity. Juvenile obesity may be due in a large proportion of cases to endocrine dyscrasia.

Obesity from an Actuarial Point of View.—Fatty people are proverbially the but of numerous jibes and jokes but obesity is no joking matter, as the fat man learns when he applies for Life Assurance and is heavily penalized. There are three grades of fatness—the enviable, the comical and pitiable, but the truth is that there is no degree of corpulence enviable. Obesity and overweight are inter-related. When one considers the difference a pound-weight on a horse-back will make to its prospect of winning a race, it must be obvious that the unnecessary burden of lard which a fat man carries about him must act as a serious handicap to his circulatory system. High blood-pressure, arterio-sclerosis, apoplexy and renal inefficiency are all concomitants of obesity. Increased deposit of fat in the heart necessarily imposes a strain on the heart and the blood vessels. Beall has calculated that every pound of fat requires 5/6 of a mile of blood vessels to supply it and that a man who is 30 lbs., overweight is carrying an extra mileage of 25 of blood vessels which must tell upon the circulatory system, taking into account the deposit in the heart itself. He points out that *fat is a parasite and as we lengthen the waistline, we shorten the life line.*

Probably the most potent medical argument against obesity is the high incidence of diabetes among the obese. Joslin goes so far as to say that diabetes is a penalty of obesity. He also

gives the following figures for the mortality of diabetic men over 45 years of age.

PERCENTAGE OVERWEIGHT		MORTALITY
5 to 14	...	2 × normal.
15 to 24	...	4 × normal.
25 and over	...	10 × normal.

Further, the incidence of gall bladder troubles with formation of gall stones is very great in obese persons. Mechanical difficulties of nursing heavy patients and increased risk of infection after accidental injuries and surgical emergencies are further impediments.

However, it is universally recognised that individuals under 35 are much better insurance risks, if slightly above the average weight. The small excess of fat seems to protect the individual against infective diseases such as pulmonary tuberculosis, pneumonia, etc., which are the chief causes of death in the early decades of life.

It is not an easy matter to fix a standard for obesity. While gross forms are obvious, mild degrees are less readily appreciated. There are various difficulties in fixing the optimum weight of individuals. The climatic conditions diet, occupation, race, each one of these factors has a bearing as we have already seen when considering the ætiology. After taking all these factors into consideration, the Life Insurance Companies have arrived at average tables of weight. Chiefly, sex and height have been taken into account in fixing the weight. No allowance is made for any difference in the body skeleton from individual to individual, whereas it is a matter of everyday experience that two men of the same age and height may vary by a stone in weight and yet both be perfect specimens. To overcome these difficulties various calculations have been suggested to give ideal weights, which are based on several measurements of the body, but the involved nature of the measurements and calculations has limited their use. Most of the averages available, are drawn from Life-Assurance Company statistics. It is to be remembered that these published averages are averages merely, and are consequently not to be regarded as normals. To take these standards of weights given in the tables quite seriously is to say the least fallacious, especially in this country where, the bulk of the Insurance subjects are drawn from the rich families and Life Insurance has not become popular among the cultivators and the industrial population. Apart from the tables compiled by the

Oriental Govt. Security Life Assurance Company, we have no records to guide us in assessing the lives of Indians in various provinces. Most of the companies use for reference Dr. Robertson's table of average weights for adults. 'Average' and 'normal' though often used interchangeably,are far from being synonymous terms and the sooner we fix standards of what is reasonable and proper in the matter, the better it would be.

In Insurance practice, the assessment of the optimum weight should really be an individual matter and should rest on the clinical experience of the medical adviser. A thorough physical examination should be undertaken in which particular attention should be paid to the distribution of fat and also size of the bony frame. This examination together with the average tables will serve as a basis of judgement for determining the optimum weight for the individual concerned, but the advantage of slight overweight in youth and the marked advantage of a weight less than the averager after middle life when infectious diseases give way to degenerative processes, should be borne in mind.

GLEANINGS FROM MEDICAL PRESS

Medicine and Therapeutics

Air Conditioning of Pneumonia.—An editorial answer to a querist in *The J. A. M. A.* for December 10th, 1938, suggests to us the advisability of considering the inclusion of air-conditioned rooms in our newest Australian hospitals, the new Melbourne and Prince Henry's Hospitals, for example.

Whenever a patient is placed in an oxygen tent, the atmosphere surrounding him is conditioned. When tents are well designed and operated, the atmospheric conditions assist cooling and maintain a desired partial pressure of oxygen and of carbon dioxide.

The essential factors in proper atmosphere conditioning have been analysed and desirable conditions formulated (Bullowa, J. G. M. Management of the Pneumonias, New York, Oxford University Press, 1937). The factors controlled are temperature, relative humidity, rate of air movement, oxygen concentration, carbon dioxide concentration and removal of noxious substances, either chemical or particulate, which cause odours.

The necessary loss of oxygen and the introduction of surrounding unconditioned atmosphere when services are rendered

to the patient are inherent disadvantages in even well designed and operated individual oxygen enclosures or tents. Some patients have a feeling of confinement and isolation. Either the nursing and examinations are neglected in order to retain the high and uniform oxygen concentration or desirable and even essential atmospheric conditions are sacrificed.

In some climates and under some atmospheric conditions, and, in the case of less severely stricken patients, uniform high oxygen concentration may be sacrificed in order that better nursing care may be provided and physical examinations performed. Nevertheless, in some late and prostrated patients disaster may follow when, for even brief periods, oxygen concentration is diminished to provide nursing care and careful physical scrutiny.

To overcome these disadvantages, oxygen rooms have been provided in some well-equipped hospitals. In them patient and nurse are simultaneously enclosed. Both nursing care and the physician's observations may be provided without loss of optional atmospheric conditions.

Conditions desirable for febrile anoxic patients may not be agreeable to those entering a well-conditioned room from warm or humid surroundings. This may lead to unwise criticism. Recording instruments are accordingly desirable to proper operation of atmosphere control rooms.

Excellent, satisfactory air-conditioned rooms are in use at the Rockefeller Institute, the Presbyterian and the Harlem hospitals in New York. Those responsible for the care of patients with lobar and broncho-pneumonia in these hospitals believe that they are of great value and do not wish to give them up. In various centres improperly designed chambers have been built without suitable locks, adequate provision for air-conditioning or economical maintenance of the oxygen concentration. Naturally, these have proved unsatisfactory and have been abandoned. The principle of air-conditioning in the treatment of pneumonias is sound and in practice desirable and may be economical.

The cost of maintaining a well designed, maintained and operated oxygen chamber is not considerably greater than the cost of maintaining an oxygen tent. The first cost of installation is offset in the case of patients desperately ill by the much more satisfactory results.—*The General Practitioner of Australia and New-Zealand.*

Spastic Constipation.—In a paper Prof. *H. Eppinger* and *A. Tillich* (First Med. Clinic, Univ. of Vienna) state that colonic spasms delay the transport of the fæcal masses, which may remain for days despite strong hyperperistalsis. For weeks stagnating fæces may be demonstrated rœntgenologically in the haustra. Similar X-ray findings were obtained with normal persons experimented upon by being fed meat only: great delay in intestinal passage and spastic haustral segmentation. With a meat diet it takes 30 hours more to evacuate the intestines than with a course diet.

Characteristic accompanying symptoms of spastic constipation are; cold hands and feet, loud tympanism over the cœcal region coincidental with dullness and tenderness of the sigmoid and the lower portion of the descending colon, frequently hyperacidity and ulcer pains that increase on an ulcer diet and disappear with a rough diet. The pains in the left lower quadrant may look like a "left-sided appendicitis", Daily defæcation does not exclude spastic constipation (obstipatio sine obstipatione). It is even possible that paradoxical diarrhœas develop as a result of the irritating effect exercised by the hard fæcal masses on the intestinal mucosa. Other consequences are ulcerations, hæmorrhages, adhesions (as a result of peritoneal irritation). The type accompanied by diarrhœa is the very one not infrequently manifesting involvement of the urinary and biliary passages (pyelocystitis of young girls, cholecystopathies through colibacilli and enterococci). Coarse diets during the War caused a sharp decline in spastic constipation and simultaneously in cholelithiasis. If a bland biliary colic is accompanied by spastic constipation, the gall-stone affliction will best be influenced by a coarse diet. Remote complications of spastic constipation are headaches, anorexia, extrasystoles as a result of, among other reasons, conditions due to intestinal intoxication.

One prescribes 250 gm. of whole-grain bread daily, containing the whole grain and its sheaths, about 3½ lbs. of fruits and coarse vegetables, also dried fruits (prunes); to this are added, depending on the nutritive condition, meat, fats and carbohydrates. In patients with a sensitive stomach or in those who have enjoyed a soft, protective diet for a longer period, the change to a coarse diet must be very gradual. At the same time a mild laxative with belladonna is to be administered: Rp. ext. aloe, ext. rhei ana 80 to 160 gr., ext. belladonnæ 15 gr. M. f. pil. No. C. S. 1 pill in the evening. For pseudodiarrhœa (hard, small fæcal masses with mucus, pus, perhaps blood) belladonna should

be prescribed; for more severe diarrhœa, grated apples or apple puree for 1 to 2 days, and then gradually introducing a coarse diet. (Wien. Klin. Wschr., No. 51, 1938).—*Ars Medici.*

Phosphaturia.—Is found, according to *M. Marbois* (Chief of the Laboratory of Brussels) in three groups of disease: neuro-arthritis, in certain digestive disturbances and in pulmonary tuberculosis. The clouded urine clears the moment a few drops of nitric acid are added. Phosphaturia is in relation with the pH of the urine and the vitamin C metabolism. Treatment should decrease the alkalinity of the urine, which can best be done with a medicament that, it is true, is frequently poorly tolerated with intestinal disorders, namely, Fowler's solution. Adults are given 4 to 5 drops before the midday and evening meals for 14 days, a child of 2 years one drop. This cure is well tolerated by patients with pulmonary tuberculosis. Surprisingly enough, less is achieved by lemon juice than by the arsenic solution. Injection of ascorbic acid, pure vitamin C, mostly fails by itself; it must be combined with arsenic. Waters of La Bourboule have a favourable effect. Digestive affections must at first be treated with a correct diet and the corresponding medicaments. In these cases we are usually dealing with dyspepsia with hyperacidity, which reacts well to kaolin-magnesium-bismuth powder. About three weeks later, water of La Bourboule (one glass at each meal for 3 weeks) or a cure at this spa can be prescribed. As we know, ascorbic acid is found abundantly in green vegetables, fruit juices, sour fruits, and in the liver, kidney, etc. Not all of these foods are easily digested. They must be prescribed in accordance with the tolerance of the patient in question. (Bruxelles Med., 1. 1939.)—*Ars Medici.*

Toxic Manifestations of Sulphanilamide. — Sidney E. Stout, in the *Texas State Journal of Medicine* for February, 1938, gives a summary of the toxic manifestations of sulphanilamide according to the systems affected.

Blood Picture. (1) *Cyanosis*:—The occurrence of cyanosis following the sulphanilamide therapy may be attributed to the presence of either a sulphæmoglobinæmia or a methæmoglobinæmia. Methæmoglobinæmia occurs in a considerable portion of persons taking large doses of the drug. In the presence of sulphates of any form, notably from the administrrtion of

magnesium sulphate, concurrent with the administration of sulphanilamide, sulphæmoglobinæmia develops. Likewise, any purge increases the hydrogen sulphide production in the large bowel and increases the possible occurrence of sulphæmoglobinæmia. Sulphæmoglobinæmia is a serious complication to a sick patient for it represents a permanent loss of the blood so involved. Spectroscopic examination of the blood is the most reliable means of differentiation of the cause of cyanosis.

(2) *Bone Marrow Depression*:—Since sulphanilamide is essentially a substituted aniline, the hæmolytic properties of the benzene structure are obviously possible. Confirmatory of this are the reported cases of bone marrow depression, both erythrocytic and leukocytic. A hæmolytic anæmia may be produced which is quite striking in its resemblance to the hæmolytic crisis produced by the use of phenylhydrazine. The blood picture itself shows a sharp decrease in the number of erythrocytes with a proportionate decrease in the amount of hæmoglobin, evidence of both erythrocytic regeneration and destruction, together with leukocytosis. Cases of leukocytic depression vary from a mild leukopenia to a complete agranulocytosis. Sulphanilamide by its chemical structure is a potential marrow poison, and therefore, treatment should be guided by blood counts whenever possible.

(3) *Acidosis*:—A decline in the carbon dioxide combining power of the blood has been noted, and actual acidosis at times occurs due to the loss of alkalies by way of the urinary tract.

Skin Manifestations:—As with any chemotherapeutic agent, the possibility exists of the occurrence of typical allergic phenomena of the skin. Confirmatory of this are the reports of urticaria following the use of sulphanilamide. However, the most frequent cutaneous manifestation seen following sulphanilamide therapy is the development of a maculopapular eruption identical in appearance to measles with intense itching and fever. The rash usually appears on the ninth to tenth day of treatment and disappears 36 hours after withdrawal of the drug. In addition to the toxic erythema, cases have been reported showing purpuric phenomena, indicating that sulphanilamide possibly possesses vasculotoxic properties. Another interesting but unexplainable skin manifestation is the photosensitization in some individuals making them extremely susceptible to sunlight.

Nervous System:—In most instances the administration of

sulphanilamide produces a distinctly depressing effect. Headache, dizziness, lassitude and general malaise are of common occurrence. The mental confusion often occurring is said to be of the same character as the toxæmia produced by ethyl alcohol. Peripheral toxic neuritis is known to occur together with various paraesthesias after the administration of sulphanilamide.

Gastro-intestinal Tract :—The gastro-intestinal tract is frequently affected and manifests its idiosyncrasy by symptoms of nausea, vomiting, abdominal pain and diarrhœa. Depressed hepatic function is occasionally recognised by the bromsulphonephthalein test.

Classification of Toxic Effects :—The following is a classification of the toxic effects of sulphanilamide according to the degree of severity :—

(1) Mild (Continue with medication). General malaise, headache, nausea, tinnitus and vertigo.

(2) Moderately severe (Vigilance and reduction of dosage). Cyanosis, abdominal pain, diarrhœa, skin manifestations, acidosis, toxæmia, fever and paraæsthesias.

(3) Severe (Discontinue medication). Severe toxæmia (fever and tachycardia), acute hæmolytic anæmia, leukopenia and jaundice.

Treatment —Management of the toxic manifestations may be classified as prophylatic and therapeutic, In the former it is wise to be familiar with the toxic manifestations of the disease and to watch closely for their appearance during active treatment. The administration of 10 gr. of sodium bicarbonate with each dose of sulphanilamide will prevent impending acidosis. The use of sulphates in any form or cathartics should be abstained from during active treatment. A wise precautionary measure is to give no other medication while administering sulphanilamide. The blood of patient receiving large doses of sulphanilamide should be carefully observed for evidence of bone marrow depression.

The treatment of severe toxic effects aside from the withdrawal of the drug consists of forcing fluids, blood transfusions, particularly in leukopenias, hæmolytic crisis and sulphæmoglobinæmias, and the administration of oxygen when cyanosis is due to methæmoglobinæmia alone.—*The General Practitioner of Australia and New Zealand.*

———

Surgery

Treatment of Infected Wounds with Urea.—Two articles on this subject are before us. G. E. Baker (*Rocky Mountain Medical Journal*, April 1938) uses solutions, whilst Muldavin and Holtzmann (*The Lancet*, March 1938) use urea crystals.

For the last year Baker has used from 25 to 30 per cent. solutions of urea for the treatment of wound infections. Results have been uniformly gratifying. It has been found to be stable in solution, non-toxic and remarkably effective in the removal of wound exudates, bringing about normal repair of tissues through its passive mechanical cleansing action. The material has been used in the same concentrations for the irrigation of wound sinuses. Open wounds demonstrating infection, fistulas or sloughs of the abdominal wall following operation, chronic discharging ulcerous areas, sinus tracts resultant from chronic bone infections, and the like, have undergone treatment with urea. Within a few days after institution of treatment the indolent areas of the wound begin to assume a freshened pink appearance and have a tendency to bleed freely. Wound exudates are readily extruded. Improvement is definite and continued. The odour from draining wounds is reduced to a minimum, often disappearing entirely. Pain due to prolonged use may be overcome by either reducing the strength of the solution slightly or by the use of a mild sedative before renewing the dressings or beginning the irrigations.

The procedure that Muldavin and Holtzmann used in the treatment of 170 cases of variously infected wounds with urea crystals is as follows :—The wounds were syringed free from pus and necrotic material with a saturated solution of urea, excessive moisture was removed and urea crystals were then liberally applied. Waxed paper was placed next to the crystals to keep them in contact with the wound and to prevent the dressings from becoming soaked. This had the further advantage that it prevented the dressings from sticking to the raw surface of the wound. In all but small wound zinc cream was spread over the adjacent skin. This was used as a precaution, since some moisture will reach the surrounding skin however carefully discharging wounds are dressed. Owing to the extreme diffusibility of urea when combined with a saturated solution for syringing, even the deepest wound can be treated effectively. After two or three applications, sloughs disappear and also any foul odour. Replacing the slough is a highly granulating surface. However sluggish

the local metabolism may be, this response apparently can be relied on and is often spectacular.

Septic burns under this treatment become clean and form granulations so quickly that the surrounding epithelium is able to grow in with but little delay. The same prompt response is often obtained in varicose ulcers. The time taken for complete healing of the ulcer depends on its size and depth and on its chronicity. The response of superficial abscess is good ; the area of induration surrounding an abscess was eliminated in some and diminished in all cases by the urea. In the treatment of carbuncles, urea could be relied on to free the area of the wound from necrotic material.

There is no evidence that urea directly stimulates epithelization. For this reason urea cannot be used as an " all purpose " casualty dressing. Urea does not exert an osmotic effect, no matter how applied, since cell membranes are freely permeable to it ; *i.e.*, any strength of aqueous urea solution will hæmolyze blood. Pain experienced as the result of the application of urea cannot be due to an osmotic effect.—*The General Practitioner of Australia and New Zealand.*

Bites of Animals.—Must always be considered a serious injury. *E. Leuze* (Munich) reports on a woman, age 60, who was slightly bitten on the hand and on the forearm by a healthy Angora cat. The rapidity with which extreme painfulness, under irrelevant objective findings, manifested itself, was most striking. Despite immediate immobilization of the injured extremity and treatment with alcohol poultices, the condition became worse. The wrist swelled up after 17 days ; an incision was made. No pus was found, but a markedly gelatinous tissue had developed. In the culture germs were found which could not as yet be classified : "hæmoglobinophile, short, compact, gramnegative bacilli". The same germs were found in the mouths of other healthy cats.

The bite of an animal represents an irregular, contused and torn wound. When it is made, the micro-organisms of tetanus, anthrax, tuberculosis, gaseous œdema, strepto-, staphylococci, etc., may be pressed into the body. Such wounds should be treated most carefully as early as possible, preferably by exposing the wound, excising the contused tissue and removing all pockets. Every case must be kept under observation ; the possibility of rabies should always be kept in mind. The part of the body injured also determines the further course of the lesion; the nearer the injury lies to vital centres, the more dangerous it can become. (Zbl. f. Chir., vol. 64, 1938.)—*Ars Medici.*

PROCEEDINGS OF CONFERENCES, SOCIETIES, ETC.

Oto Rhino Laryngological Association, Madras.

At a clinical meeting of the above association which was held on Friday, 23-6-1939 at 6-30 P.M. in the Ear, Nose, Throat Department of the Government General Hospital, the following interesting cases were presented by the President, Dr. P. V. Cherian F.R.C.S., D.L.O.

1. *Papilloma Vocal Cord*:—Patient, a child aged 5, was brought in four months ago for difficulty in breathing. Tracheotomy was done as an emergency measure. Directoscopic examination revealed the presence of numerous papillomata over both vocal cords. They were all removed at the first sitting and the sites of origin were dealt with the Galvano-Cautery. The child was given a course of deep X-rays to the larynx. The child was brought in again with a recurrence after two months.

The incidence of Papillomata being only in childhood and the tendency to their spontaneous disappearance at puberty has led some to believe that it has some remote connection with the hormones. Hence it has been suggested that sex hormone therapy might be given a chance in these cases.

2. *Paralysis of the Vocal Cord*:—Patient, a middle aged waiter at a hotel, was attending the medical side of this hospital for cough. He was treated for "bronchitis" and was sent to this department for hoarseness of voice. Indirect laryngoscopic examination revealed the presence of a paralysed left vocal cord. An X-ray of the chest was suggested and taken which revealed the presence of an aneurysmal dilatation of the aortic knob. On further examination a ringing aortic second sound with a systolic bruit over the carotids were the only signs of early aneurysm of the aorta. Patient had syphilis 10 years ago.

This case serves to emphasise the importance of routine laryngological examination in all adults with cough and hoarseness of voice. Otherwise many a case of aneurysm will be missed in the Out-Patient Deparment.

3. *Cancer Tonsil*:—Response to Deep X-ray Therapy of cancer of the tonsil in the case of a patient, female aged 50, was demonstrated. She came in with a cauli-flower-like growth of fairly large dimensions on the right tonsil. She was given a course of Deep X-rays to the primary focus ; and the glands on the neck were treated with a radium pad. After three months' treatment the patient is today seen with only a trace of the

growth left. The glands on the neck showing no tendency to shrink.

4. *Nasopharyngeal Sarcoma*:—A case of sarcoma of the nasopharynx was next demonstrated. The patient, a young adult, came for nasal obstruction. On examination, a hard tumour was found in the nasopharynx. An exploratory puncture drew pure blood confirming the diagnosis of sarcoma. Deep X-ray therapy is being tried.

5. *Intrinsic Cancer Larynx with Syphilis coexisting*:—Patient, male, aged 50, was attending the medical side for "asthma". He was sent here for examination of the throat. Indirect laryngoscopic examination revealed the presence of an ulcerative growth over both vocal cords. As the patient had dyspnoea, a tracheotomy was done and under directoscopy a small piece of the growth was taken for pathological examination. Report: 'Suggestive of malignancy, repeat specimen'. Routine blood examination gave a strong positive W. R. The therapeutic response to bismuth is being tried as the patient is too old to undergo any active anti-syphilitic treatment.

A number of interesting X-rays of the larynx, normal and diseased, were demonstrated by Dr. J. Jacob M.B.B.S., Honorary Assistant, Ear, Nose and Throat Department, General Hospital. He explained the value of X-ray diagnosis in laryngological practice, viz :—

1. A definite aid in the diagnosis of laryngeal ailments of children without subjecting them to directoscopic examination, an indirect examination being next to impossible in their case.

2. A positive evidence of the response of laryngeal cancer to treatment (by repeated X-rays of the larynx as in the treatment of fractures.)

3. A permanent clinical record; it speaks for itself.

4. In gauging the actual extent of the growth in cases of cancer larynx, X-ray shows more than what direct examination can reveal.

5. As an aid in differentiating benign from malignant neoplasms, the X-ray reveals the indistinct border in cases of malignancy unlike the smooth and clear cut edge of a benign growth shadow.

The X-rays demonstrated were:—(1) The normal larynx with a key diagram drawn by Dr. K. M. Rai, of the B. I. R.

(2) Hypertrophic Tuburcular Laryngitis without ulceration, showing greatly thickened arytinoids, epiglottis and the aryepiglottic folds.

(3) Syphilitic Laryngitis showing patchy sclerosis of the cartilage as in long bones.

(4) Post-cricoid growth.

(5) Papillomata : — The well-defined margin serves to differentiate these from malignant neoplasms.

(6) Cancer:—In early cases the infiltrating nature of these malignant growths gives them an indistinct margin. X-ray shows actual area infiltrated which is usually more extensive than what the naked eye discerns. In advanced cases the X-ray reveals ulcerating margins and the track of the sinuses.

(7) Paralysis of the Vocal Cord :—Here the pyriform fossa shows alteration in shape. The paralysed side shows flattening of the ellipse. In cases of fixation of the vocal cord due to extraneous additions the curve of the ellipse may be deepened or contorted unlike the mere flattening of true paralysis.

(8) Foreign body in the left bronchus: An unusually interesting case of foriegn body in the Left bronchus was admitted into the hospital a few days ago. X ray revealed theF. B.—a common pin—in the left bronchus. It was removed through bronchoscope with some difficulty. The child was discharged after a stormy recovery.

BOOK REVIEW

Medical Treatment in General Practice with Recent Advances with a Foreword *By Bt. Col. Chopra*, C.I.E.,M.D., Sc.,D.,(CANT) *By D. R. Dhar*, M.B.,D.T.M., (CAL.) M.R.C.P., (LOND.) Pp. 596. D. M. Library, 43 Cornwallis Street, Calcutta. Price Rs.10/8. Foreign 22*s*. 6*d*.

The author is an experienced teacher of medicine for over 10 years at the Calcutta National Medical Institute, the outcome of his teaching experience has been incorporated in the production of this useful book.

Nearly all the text books on medicine deal extensively with the Ætiology, Symptomolgy, Pathology, Differential Diagnosis, etc. but Treatment has always been meagre. The present book which is mainly intended to give the reader in an exhaustive—yet concise manner, the treatment of common diseases in India, will be greatly appreciated.

To write a book on the treatment of diseases is no easy task, considering the rapid rate of growth of knowledge on the

treatment side,while the proprietary products in the market have grown at an even more rapid rate,so much so, one is bewildered to hink of them. The writer has given the Symptomatology and clinical finding etc., just in a passing manner to make the book more interesting and has made up the loss on the treatment side.

There are as many as eighty-one chapters in the book which includes an index. The first three chapters are taken by Introduction, Infection Immunity,etc. Chapters IV—XXXV deal with common Infectious Diseases. The treatment of Diseases is considered under the various systems. Many useful and tried prescriptions are given which would help the young practitioners, when confronted with prescribing for a case.

The author has certainly supplied a real want in the medical curriculum with this new work on treatment.

The inclusion of Indian dietary in the Treatment of Diseases will be much appreciated. We congratulate the author for the success he has attained in bringing out a work that has been lacking in medical book shelves. We wish the book all success.

CORRESPONDENCE

Infantile Biliary Cirrhosis

Of recent years, much attention has been focussed on the infantile morbidity and mortality caused by Cirrhosis of the Liver, in various parts of India, particularly the South and Bengal. The clinical syndrome in this condition has been described by many writers who claim for it a distinct clinical individuality. But it must be admitted that in a disease of such insidious onset, slow and silent evolution and vaguely complex termination as hepatic cirrhosis, the clinical picture is far too colourless to permit an early and certain diagnosis, even apart from the possibility of establishing in the condition under reference, an individuality distinct from the usual forms of infantile hepatomegalies and cirrhosis occurring also in other parts of the world.

From the more recent descriptions of the morbid anatomy and histology of the liver in this condition, it is clear that the process is one of a progressive toxic degenerative cirrhosis with varying degrees of nodular parenchymal regeneration. It is only sometimes complicated by a diffuse, biliary, inflammatory, and constrictive obstruction.

The knowledge of its clinical pathology and aetiology is, however, fragmentary and hazy. Its blood chemistry and gastric and hepatic functional explorations particularly need careful and extensive study. Its aetiology has afforded a very fertile field for much speculation and sometimes even to fanciful theorization. An attempt has no doubt been recently made by Narayanamurti and Tirumurti to map out its geographical distribution in India. The reliance placed by these authors on information gathered through questionnaires distributed to the customers of dealers in alleged, secret, specific remedies of hepatosplenic disorders, is, however, open to the objection that, in such a procedure, not only is the diagnosis defective, in as much as the same is left to the uninformed, ignorant parents of the affected children, but also to the fact that the figures of incidence are probably governed more by the varying intensity in the methods of advertisement of the specific in different areas, than by genuine variations in the intensity of incidence. One also observes wide variations in the figures regarding communal incidence recorded by different authors. Concerning the exciting causes, a confusing array of aetiological factors have found mention. Unhealthy maternal milk, various artificial foods, premature ingestion of starchy diet, excessive fatty meals, foetal and maternal infections, vitamin and endocrine infantile deficiencies, specific and virus infections have all been mentioned as possible aetiological agents, though in many instances without the least justification. Even climatic factors and faulty hygiene of the infant have been included among the offending agents.

In view of this uncertain state of the present knowledge of the aetiology and pathology of this condition of so-called Infantile Biliary Cirrhosis, a systematic scientific survery of the possible forces governing its aetiology and pathogenosis, throughout the Province, appears to be urgently called for. With this end in view, a questionnaire including certain points of aetiological and clinical interest is being addressed to the several district medical organisations through their respective heads. It is hoped that the co-operation of the entire medical machinery might produce a mass of comparable and reliable data which may indicate the path to a successful solution of the aetiology of this vague condition, apparently becoming an increasing menace to the infant life of this country.

Madras,
May 1939.

P. Ramachandra Rao, M.B., PH.D., (Lond.),
Professor of Pathology, Medical College, Madras.

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Questionnaire regarding the Ætiology of Infantile Cirrhosis of the Liver.

Sample Entry.	No.	Sex.	Age of Child	Serial No. of the child among the issues.	Race and Religion.	Duration of Disease.	*Progress and Termination: observation: progressing downwards.	Condition of the Liver.	Condition of Spleen.	Time of onset of Jaundice if present.	Nature of Stools.	Time of onset of Ascites if present.	Urinary findings as regards bile-pigments and salts.	Diet of Parents.	†Observations on the diet of the Child.	Teeth and Bones.
1		Male Child	2 Years and 6 Months	5th	Hindu Brahmin.	3 Months	6 Months under observation: progressing downwards.	2″ below costal margin and soft.	1″ below costal margin and hard	Absent	Pale Solid	Since 1 month	Bile salts & pigments ++	Vegetarian.	Artificially fed since 4th month on diluted Cow's Milk.	Normal.

Signature & Designation.

Place.....

Date.....

Notes:—A sample entry is made in the 1st column.

**Progress and Termination*.—Mode of death may be noted if terminated fatally.

†*Diet of the Child*.—If starchy foods have been administered, please note at what age and in what form such foods were started.

Family History:—(1) Please state whether any of the children in the family suffered from liver complaints. If so, how many, their relation-ship and termination.

(2) A note on the habits and general health of the parents particularly regarding incidence of alcoholism, syphilis and tuberculosis may be included.

Extra Information.— (1) Observations regarding seasonal variations in the progress of the disease.

(2) Information regarding the relation of the hepatic condition to gastrointestinal disorders, if any, may also be given.

Please return this questionnaire duly filled up at the earliest opportunity to the address given below:—

U. Srinivasa Rao, M.B., B.S.,
Research Scholar, Department of Pathology,
Medical College, Madras.

Dracontiasis or Guinea Worm Infestation.

Dr. I. David, Colombo, writes:—

With reference to Capt. Ghosh's article on the above subject, my experience is that Neo-Salvarsan is a better and more certain remedy for Dracontiasis. Since Salvarsan came into use some 25 years ago, I have been using the drug for various non-syphilitic diseases, chief among them being Chronic Recurrent Malaria, Parangy, Chronic Skin diseases, Ratbite Fever and Dracontiasis. In fact, I was the first, as far as I know, to use this drug in treating Ratbite fever and report the result before the B.M.A. (C.B.)

Dracontiasis is met with occasionally among Chettiars, and others, that come from South India, the seat of infection being usually the lower limb. I do not remember any of these cases requiring more than a single injection of a fairly large dose of Neo-Salvarsan for a radical cure.

PREPARATIONS AND INVENTIONS

Veganin.—*Manufactured by Messrs. William R. Warner & Co. Ltd., of London.*

The subject of pain is always with the physician, commanding his interest, both in its physiological and psychological aspects and especially in the challenging problem as to how he may appreciate its diagnostic significance, pay due heed to its warnings, and mobilize available resources for its relief and conquest.

Anatomists and physiologists, surgeons and pyschologists and many clinical observers among general practioners, are all making their contribution today to the investigation and alleviation of pain.

To the physician pain is but a symptom, an alarm signal; but to the patient it is an affliction that is very real and which demands early relief. The type of pain, its location, distribution, and time of occurrence; all these have a diagnostic significance, but once they have served as a guide to let pain continue unrelieved is to give it a free rein in causing suffering and disability.

A number of analgesics have been placed in the hands of doctors by manufacturers for the prevention and alleviation of pain; but one that has been the subject of high commendation in medical and dental journals, and has aroused wide-spread enthusiasm among members of the medical profession in Great Britain and other parts of the world is Veganin.

Veganin is a dependable, safe and highly effective, analgesic, sedative antipyretic with marked antispasmodic properties.

Veganin is presented in the form of tablets which are prepared by a special process that ensures rapid disintegration, ready utilization and prompt therapeutic action. It is claimed that the administration of Veganin is free from elements of danger, and the preparation, therefore, provides a welcome substitute for the barbiturates.

The manufacturers further state that " Veganin can be used for the relief of pain and its nervous manifestations in a large number of conditions; and in febrile conditions its administration results in early remission of the temperature. Its use as an analgesic in absence of fever leaves the temperature unaffected.

'Nicamide'.—*Manufactured by Burroughs Wellcome & Co., Snow Hill Buildings, London, E. C. I.*

'Nicamide' Nicotinic Acid Diethylamide, a powerful respiratory and circulatory stimulant, is available to the medical profession as a 25 per cent. solution for oral administrstion, in bottles of 15 c.c. and 100 c.c. and as 'Hypoloid', 'Nicamide'; a 25 per cent. solution for intravenous or intramuscular injection in ampoules of 2 c.c. and 5 c.c. Following the administration of 'Nicamide', depth and frequency of respiration are stimulated, and the force of cardiac contraction is increased. The drug causes a rise in blood-pressure probably brought about by reflex stimulation of the vasomotor centrethrough the carotid sinus. 'Nicamide' acts effectively either by mouth or by injection. The indications for the eus of 'Nicamide' include all conditions associated with shock and depressed circulatory and respiratory states.

Hordenol.—*Manufactured by G. Beytout Laboratories, Paris.*

Hordenin sulphate, temporarily discarded as a therapeutic agent, has been studied again and successfully reinstated in the domain of therapeutics for the treatment of Diarrhœas of any nature, origin, or degree of intensity: toxic, seasonal and amœbic diarrhoeas, diarrhœas of tuberculous patients, of infants and nurslings.

It is, nowadays,prepared synthetically, just like such chemical substances as tyrosin, adrenalin and tyramin which are closely related to it.

By this synthetic preparation it is possible to obtain a perfectly pure, crystallized product with a definite formula (CIOH 15 NO) and an invariably uniform therapeutic action.

It is hordenin sulphate that is used the most commonly in the treatment of diarrhœas, preferably by subcutaneous injection, or by oral route. The toxicity of hordenin being extremely low, the use of hordenin sulphate is practically free from dangers on therapeutic doses.

The action of hordenin sulphate on the digestive tube is the most important of its properties. In fact, hordenin sulphate possesses a very remarkable anti-microbial action: on a 4% dose it will stop the development of the colibacillus and the bacillus of Messea; on a 5% dose it will inhibit the proliferation of the E. Berthian bacillus.

When used in the treatment of diarrhœas, it appears that hordenin has a twofold action: on the one hand it reduces the reactional hyper-secretion of the irritated intestines (due to its hypocrinic and antiseptic effect): on the other hand it checks intestinal hyper-peristaltism (thereby stopping intestinal colics) and lastly by a probable phenomenon of bulbar regulation.

The posology of hordenin sulphate in the treatment of diarrhœas varies between 15 and 40 cgr. per day. There is a considerable margin of safety since daily doses of 2 to 3 gm. associated with enemata of 25 to 75 cgm. did not cause any untoward effects (SABRAZES AND GUERIVE.)

Nowadays hordenin is used in the form of HORDENOL, in ampoules of 2 c.c. each containing 0.125 of hordenin sulphate associated with small doses of sodium vanadate and trimethylxonthine (2 mgm. of each) which were chosen because their action enhances the properties of hordenin. The daily dose of HORDENOL is from 1 to 2 ampoules per 24 hours, injected subcutaneously. As soon as formed stools are obtained treatment may be continued orally.

In the majority of cases the results are striking and quick; in fact it is usual to observe a considerable reduction of stools within the first 24 hours while the consistency of such stools becomes increasingly normal. In the days that follow diarrhœa disappears completely, and a marked improvement of the general condition becomes noticeable.

Eupaco.—*Manufactured by E. Merck, Darmstadt.*

In the course of research to synthesise papaverine, an important substance, namely, Eupaverin, was discovered by E. Merck which was found to have a stronger effect than the former, although it was no derivative. Combined spasmolytic preparations where papaverine is replaced by Eupaverin have been shown to be stronger.

It contains Eupaverin, which lowers the tone of smooth muscle producing a direct relaxation of the muscle fibres; atropine, which paralyses the parasympathetic nerve endings of smooth musculature and has therefore a spasmolytic effect. Also contained are Luminal, possessing a general sedative and spasm resolving effect; dimethylaminophenazone, having an analgesic and spasmolytic effect on the central nervous system.

The effect of the combination is due to the fact that the single components quieten the movements of smooth muscled organs over different points of attack and hence dissolve the spasms in these organs. It is therefore indicated as being of great use as a spasmolytic in all spastic conditions of smooth musculature.

The 'Agla' Atomiser.—*Introduced by Burroughs Wellcome & Co., Snow Hill Buildings, London, E. C. I.*

The value of an atomiser in which all the parts in contact with the medicament are made of glass is at once obvious. The 'Agla' Atomiser produces an effective vapour-like spray from aqueous or thin oily liquids which come into contact with glass only. The Atomiser is so constructed that the larger globules of atomised liquid are effectively retained, so that only the finer spray is emitted. Having a flat base and being fitted with a rubber stopper, the atomiser may conveniently be used as a container for the medicament. When filling the atomiser the level of the liquid should not be more than half way up the delivery tube. A dropper is provided for transferring medicaments to the Atomiser. The 'Agla' Atomiser is of particular value for medication by the oral inhalation method, in which case the patient directs the spray into the open mouth synchronising deep inhalations with sharp compression of the bulb. This method is being increasingly employed in the symptomatic treatment of mild or moderately severe asthma, the medicament used being solution of adrenalin, 1 in 100. The 'Agla' atomiser may also be used with advantage for general medication of the nose, throat and the upper respiratory passages.

ANNOUNCEMENT

Glucose—D. Announcement of Price Reduction

Glucose therapy is now made widely available by the 20% reduction recently announced by Glaxo Laboratories Ltd. This welcome step now makes it possible to prescribe the treatment for the patient previously debarred by limited income.

NOTICE

Warning to Registered Medical Practitioners.

Major-General, N. M. Wilson, I.M.S., *President, Madras Medical Council, writes* :—

As a number of cases of advertisement by registered medical practitioners, in the lay Press and by means of handbills, have come before the Madras Medical Council in the recent months, the Council has, at its last meeting held on the 17th April, 1939, decided to warn all registered medical practitioners that all kinds of advertisement—including even the opening of private institutions, inviting lay men to attend functions connected therewith and publication of same in lay papers—by registered medical practitioners will be considered as advertisement under section 6 of the *Warning Notice* published by the Medical Council, and will be dealt with accordingly.

Photographs from Exposure to Print is the title of a new Burroughs Wellcome & Co. booklet. The cover constitutes a novel wallet in which prints may be accommodated.

The various stages in the making of a photograph are explained fully but simply so as to be understood by the veriest beginner. The value of those well-known aids to the amateur photographer, the 'Wellcome' Exposure Calculator and 'Tabloid' Photographic Chemicals, is amply demonstrated. Readers of this journal will receive a copy free and post free on request from the publishers, Burroughs Wellcome & Co.,Snow Hill Buildings, London, E. C. 1.

INDEX TO ADVERTISERS, JULY '39.

ment of Diseases.

Regd. No. 9 M. 429. AUGUST, 1939 Vol. XXXVI. No. 8.

The Antiseptic

A Monthly Medical Journal

Edited by

Dr. U. Rama Rau, M.L.C. & U. Krishna Rau, M.B., B.S.

CONTENTS.

Editorial and Publishing Offices: 323, Thambu Chetty Street, G. T., Madras.

London Office: 34-40 Ludgate Hill, E. C. 4.

Subscription Rs. 5. Foreign 10 sh. a year. Post paid. Single Copy As. 12—in advance.

Index to Advertisements, see page 54.

for Infectious Diseases

'Serobacterins'

MULFORD SEROBACTERINS (Sensitized Bacterial Vaccines) are known the world over for their definite value in the prevention and treatment of certain infectious diseases.

Outstanding Advantages

1. Serobacterins are less toxic than plain vaccines. Local and general reactions are reduced to a minimum.
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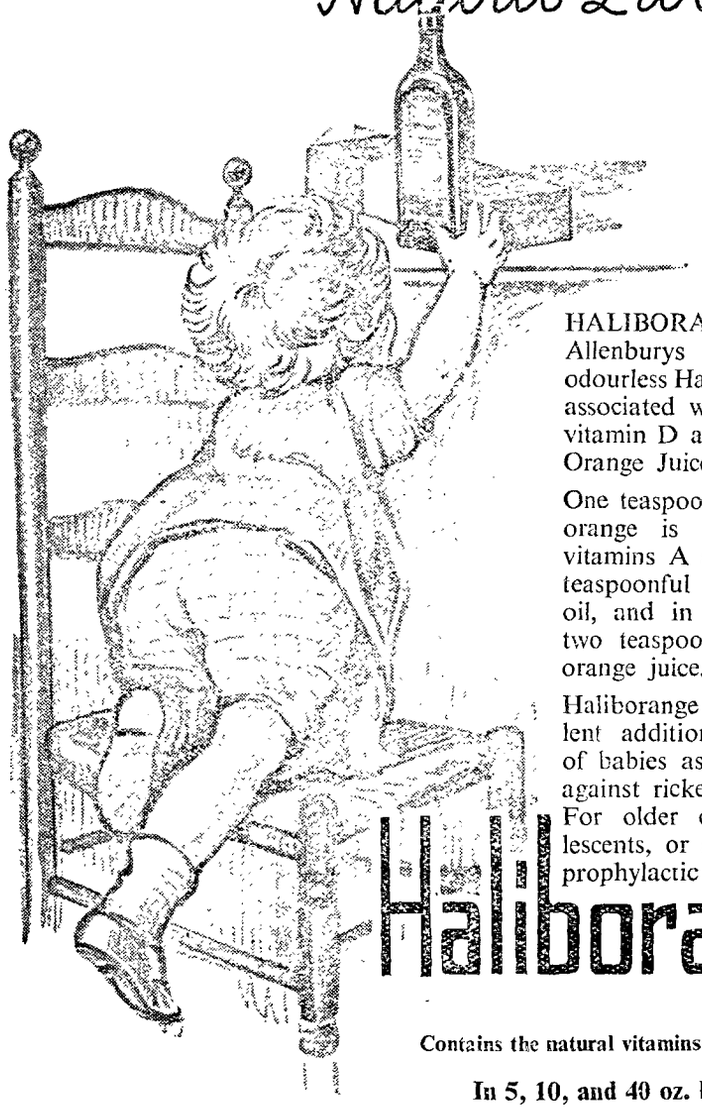

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One teaspoonful of Haliborange is equivalent in vitamins A and D to one teaspoonful of cod-liver oil, and in vitamin C to two teaspoonfuls of fresh orange juice.

Haliborange is an excellent addition to the diet of babies as a precaution against rickets and scurvy. For older children, adolescents, or adults, it is a prophylactic vitamin tonic.

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Contains the natural vitamins A, C, and D

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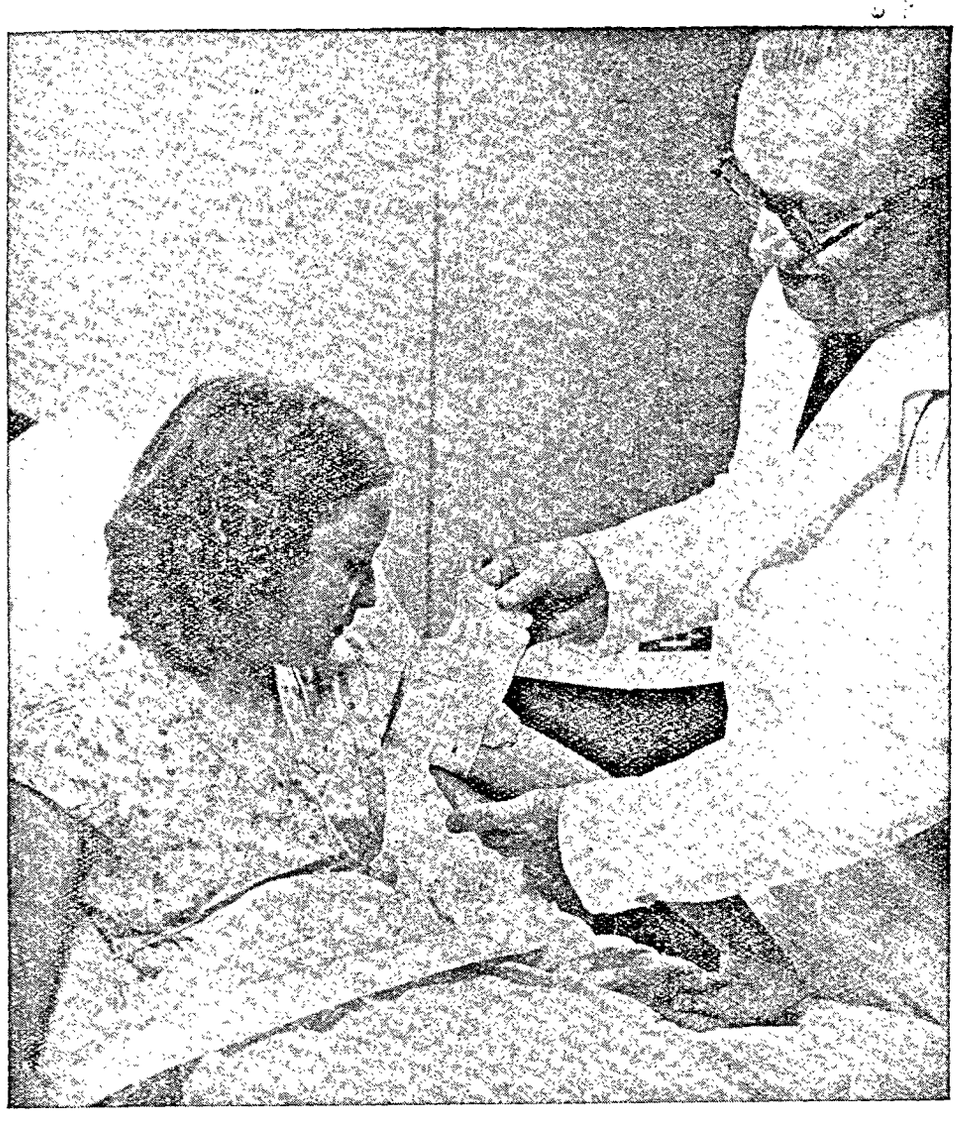

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HEPATEX-T (TROPICAL)

A notable addition to modern liver therapy which is remarkably efficient in

TROPICAL MACROCYTIC ANÆMIA

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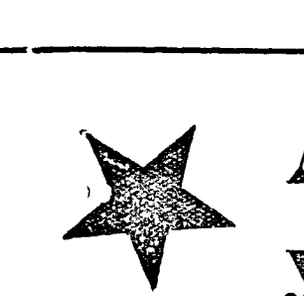

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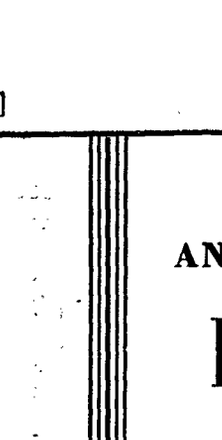

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Methods of Treatment by Adhesive Plasters

BY

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In 1929, I was asked by Dr. Haslehurst, First Assistant to the Professor of Gynæcology in the University College Hospital, Hamburg, to apply a piece of "Hansaplast" to a boil that was coming up on the nape of his neck. This boil was hard and indurated and had a diameter of inflammatory area of about $2\frac{1}{2}$ inches.

Dr. Haslehurst told me that the throbbing pain subsided soon after the application of the Plaster. In about 4 days, the swelling had considerably lessened in size and in a week's time the whole thing had nearly subsided.

Next I saw Dr. Haslehurst applying 'Hansaplast' to a case of puerperal mastitis, and the result was remarkable. In about a week's time, the swelling had almost gone and the breast had nearly resumed its normal contour. During the next few months in the Hospital, I saw several cases of external inflammation—boils, commencing carbuncles, chronic ulcers, furuncles, etc., treated by adhesive plaster methods and in almost all cases, the results were excellent.

I tried the experiment on myself about 3 years ago. On one extremity of a scar on my back (due to rib-resection after

empyema) a painful swelling used to appear off and on, which I thought was a cyst getting inflamed. Last time it appeared, it grew to the size of a marble, with an inflammatory area all around and I applied a piece of Elastoplast. The swelling gradually went down and on the 13th day when the plaster came away, there was hardly anything there to distinguish the spot from normal skin. I have never had a recurrence of the complaint till this day.

Since then, I have been using adhesive plaster in various forms for various conditions, with remarkable success.

I have used these dressings very frequently in the following types of cases :—

(1) Post-operative clean wounds.
(2) Abrasions.
(3) Wounds.
(4) Furuncles, boils, small carbuncles and other localised inflammations.
(5) Chronic ulcers.
(6) Localised burns.
(7) Certain cases of Impetigo.
(8) Nail—Suppurations.
(9) Sprains.
(10) Certain fracture cases.
(11) Bursitis.
(12) On vaccinations.

In most cases, the application is simple, but I would not say that the method is fool-proof. I know some of my comrades in the profession are less enthusiastic about this method of treatment, probably because, there is some fault in their technique, the stuff chosen, or the case selected.

I have deliberately applied the plaster over abscesses, (in which pus could be made out by palpation) and have not had to do anything more, except to watch and wait. The cure may take a few more days, than when the lesion is purely inflammatory, but I have not had to use the knife in any such cases where plaster was used. It is very probable that the cure may be considerably hastened, by first letting out the pus through a very small opening and then applying the plaster.

Its modus operandi is not quite clear: I was under the impression that it was the rest of the part, due to the plaster application that was doing the cure. But this would not entirely explain it, especially when we recollect that application

of a few inches of plaster can hardly assure rest to a part. The theory of "stewing the thing in its own juice" as applied to inflammatory lesions, is a very catchy explanation, likely to be appreciated, but it requires some more unravelling. An occlusive and protective dressing, such as Nature makes in the case of wounds, by covering them with a scab, is another explanation—the plaster taking the place of the scab. But in the case of 'blind boils' and unopened inflammatory lesions, one does not understand, how the 'scab-theory' works. In several cases of inflammatory swellings, I have used a double-layer of plaster and in these cases, it is very likely that the plaster formed a scab of protective covering for the skin against external injuries—the contents of the inflammatory swelling, in the meanwhile, getting 'stewed in its own juice'. This 'stewing' probably means that anti-bodies produced within the inflammatory area, have a chance of accumulating to such an extent, as to kill the bacteria, hasten phagocytosis and promote the process of healing. In the case of open wounds, it is very likely that in the secretion, much of the anti-bodies are thrown out when not covered up. With an occlusive covering, too many dressings are avoided; the anti-bodies are retained; the tender epithelium is given a chance to grow without undue disturbance of the parts; and the whole series of processes conduces to a quicker cure than when daily disturbed by fresh dressings. Indeed, in several of my cases, dressings to the day of cure have been reduced to two or at the most three; and I have had cases in which a simple occlusive plaster dressing was enough for the whole process of cure.

My experience of this kind of adhesive dressing, though covering a somewhat wide field, has been more in connection with wounds and localised inflammations. I must say that in the beginning, I had considerable hesitation in covering up an area whose surface was broken by a clean looking or a ragged wound, with a piece of elastic adhesive plaster and to leave it there for a few days without meddling. The orthodox teaching on the subject comprised a thorough clean up, with hot water and soap and clipping of edges through antisepsis aseptic dressings, daily changes of dressings, etc. The patient generally went through a good deal of pain, the discomfort of soaked dressings and daily change of dressings.

With the elastic adhesive dressing, we are brought into touch with a new procedure altogether.

In army service, the efficiency of this dressing has been

tested several times on the broken skin, both infected and non-infected, and the results have been remarkable. Men are fit for duty much quicker with this dressing than with the orthodox methods; continuous dressings are not necessary; and what is most remarkable, even such rigorous attention to asepsis, as the orthodox method demands is also not necessary.

About 2 months ago, one of my relations sustained several cuts and lacerated wounds in the forearm, hand and leg, on account of the bank of a tank sliding and partly falling upon her. There were several abrasions on the forearm and dorsum of the hand; some linear and some irregular wounds, right up to the muscular plane, on the Ventral surface of the forearm, the palm of the hand and wrist. Nearly the whole of the hypothenar eminence was raised and partly detached, exposing the muscles. There were several ragged wounds on the leg.

The wounds required thorough cleanings. I know of very few antiseptics, that could be applied directly to the wounds without smarting; but I have found in 'Gomenol' pure, an oil, which is not only a powerful antiseptic, but is also absolutely painless,when applied to any open wound. Indeed,it has an anæsthetic action; has a very pleasant odour;is clean and colourless; and if at all there is anything against it, it is its heavy price. With this I swabbed the wounded areas, pouring some of the gomenol into the crevices of the wound. From the quantity of loose earth that had stuck up to these wounds, it was obvious, that nothing less than a removal of coarse dirt was possible. Then I applied strips of Elastoplast covering the whole area. In those wounds where the skin had retracted leaving a gaping wound, the edges were apposed before applying the dressing. Over the whole of this area, I applied a layer of cotton wool and finished up the dressing with a loose meshed bandage over all. I am sure, that the cotton wool and bandage is a remnant of the surgical superstition; nevertheless I could not resist the temptation (Anti-tetanic serum was also given).

The pain subsided an hour after the dressing. Next day the temperature rose to 100° F.; otherwise everything appeared all right. The third day the evening temperature was 97°; on the fourth day both the morning and evening temperatures were normal. There was no discomfort; no smell and the œdema had nearly subsided. The course was remarkably smooth, with hardly any constitutional disturbance.

The great thing was to resist the temptation to re-dress. Inquiries about the condition were made almost every day; but there was nothing to note. The patient had no complaints. On the 12th day the dressings were taken out. All the wounds had nearly healed, except the one at the hypothenar eminence. When the elastoplast over this was removed two or three drops of pus welled out from a corner of the wound. This was cleaned

and another piece of adhesive applied. In another week, the dressings were removed and the wound had healed remarkably well, leaving very smooth and even surfaces. The results were excellent.

The advantages of this method are obvious: (1) The busy practitioner, the rural doctor and even the Hospital Surgeon has at his command some ready made material that can be successfully used against various "surgical happenings" in a moment. There are many kinds to choose from and in the long run these plastic dressings will become cheap. (The following list is shown here because it contains varieties with which the author is familiar—Elasto-plast (English), Emergo-plast (Boots, British) Leuko-plast, Crepo-plast, Handy-plast (Biersdorf, German) Hansa-plast (German), Gemania-plast (German). There are plasters that are medicated and non-medicated. I have not had the occasion to gauge any particular good to be derived from medicated plasters. (2) The usual orthodox surgical toilet of the wound is not necessary; a moderate amount of cleaning is all that is required. In all suspicious wounds, injection of Anti-tetanus serum is, of course, necessary. (3) The pain disappears very quickly. (4) Too many dressings are avoided, which is a great gain to the patient; it not only saves the expense, but also prevents much needless pain. (5) I think temperature reactions must be far less common with this method than with the orthodox methods. (6) The easiness of application.

The disadvantages in the line of applicability of these plaster dressings are hardly any. There are some very rare instances of sensitiveness of skin to plasters; I have not had any. It may be brought forward that the difficulty of not being able to notice the septic process under the plasters, ought to be a great disadvantage; but in practice, such a disadvantage does not obtain, because it is not necessary to be so constantly looking for suppuration.

Before applying the dressings, coarse dirt must be removed. Benzene may be used; but I have found 'Gomenol' one of the best, though it is costly. The hair must be shaved or cut close. Tincture Iodine should not be used. No gauze or other dressing need be placed over the wound or inflammatory area, for plaster application; and the plaster should always be applied in absolute contact with the skin, and invariably, a little distance beyond the wound, or the outer circumference of the zone of inflammation. It may often be necessary to cut the plaster into various patterns to closely fit in on the part to be applied.

In those cases where adhesive plaster dressing is indicated I have had very few failures.

I hope my professional brethren will be stimulated to try these plaster dressings more extensively and that the readers of this magazine will have the benefit of their experiences.

The Modern Treatment of Asthma

BY

C. U. Parvani, M.B., B.S.,

Gambat.

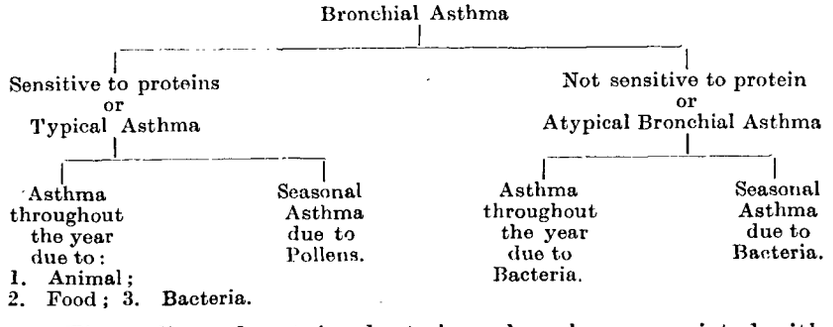
THE lot of the average asthmatic is an unhappy one, in as much as the attacks tend to occur just when he is in the prime of life and also because during the intervening periods of fair health, he is regarded as normal by himself, his friend and his medical attendant. In most cases, because of the paroxysmal and functional nature of the condition, he himself does not desire to undergo strict and prolonged treatment and drops the treatment as soon as improvement occurs. Most workers are agreed that complete and permanent cure of attacks is attainable only in 30% of cases and further 50% can be much improved and that there remains a group of 20% who are not benefited by any treatment. The physician should start with the aim of completely curing every case. He should get the confidence of his patient and encourage the idea that complete cure is possible only, when he (asthmatic) extends his active co-operation and maintains strict discipline over many months. To adopt a palliative line of treatment without first an attempt to complete cure is neither fair to the practitioner nor to the patient. The scope of this article is limited to the treatment only, yet, for better understanding of the line of treatment, I shall briefly go through various causative factors and suggest that line of treatment which could be conveniently carried out in a moderately equipped dispensary.

Since, Sir John Floyer in 1648 first described asthma, an enormous volume of literature has appeared in an attempt to explain the causative factors of asthma. It is characterized by sudden paroxysmal dyspnœa and prolonged respiratory effort. This is due to an obstruction to the respiration occurring in and about the bronchi and bronchioles. This may be caused by a contraction of the bronchial muscle, by inflammatory or urticarial swelling of the mucous membrane, narrowing of the calibre of bronchioles or by the partial occlusion of the lumen with bronchial secretion. This muscular tissue is supplied by the Vagus nerve. It is believed that Asthma diathesis is caused by slight deviation from the average blood chemistry which results in an unbalanced action of vagus and sympathetic branches supplying the bronchial muscle, vagal nerve preponderating. Hence asthma

is regarded as being one of the symptoms of vagotonia which is brought into evidence most frequently by hypersensitiveness. Therefore, the treatment is aimed at removing the cause of hypersensitiveness and at stimulating the sympathetic nervous system with adrenalin or of paralysing the vagus with atropine.

A further biochemical factor depends upon the varying activities of the internal secreting organs. The effect of fatigue as shown by the increased tendency to asthma towards the end of each day or each week and each period of work without holiday is best explained as the result of exhaustion of the suprarenal gland, whose deficient secretion helps the vagal elements of the nervous system to control the bronchi and gain the upper hand over the sympathetic elements, the activity of which requires an adequate supply of adrenalin. In support of this theory, the blood pressure of the asthmatics is generally low and Oriel has observed that several asthmatics have well marked hypoglycæmia and give a glucose tolerance curve indistinguishable from that found in Addison's disease. The unfortunate influence of menstruation on female asthmatics must also depend upon some alteration in the normal balance of internal secretion.

Von Pirquet first introduced the term allergy (altered reaction). It is supposed that foreign proteins or 'allergens' obtain access to the body either by inhalation, by ingestion or even by contact with body surface and in supersensitive individuals produce an attack of asthma. These causal factors act by liberating a chemical substance, histamine, which produces the spasm. The bronchial asthma is classified by those who believe in this theory into (*a*) Typical Bronchial Asthma, that is, sensitive to protein and (*b*) Atypical Bronchial Asthma, that is, not sensitive to proteins.



The pollen of certain plants have long been associated with seasonal incidence of asthma. They gain access to the body by

inhalation, produce in early stages œdema of the nasal mucous membrane and running of watery secretion, which contains a large percentage of eosinophiles. Similarly, the animal emanations *i.e.*, the inhalations of the proteins contained in the hair, dandruff and skin, dust of the horse, dog, cat, cow, buffalo, of fur-bearing animals such as pets and fur-wearing apparel and proteins in the feathers of chicken and goose are frequent causes of asthma. Dust from places of work and factories and household dust are incriminated as causal factors of asthma. In my series of cases reported in *Sind Medical Journal*, Vol. X, only 18·1% were typical asthmatics and the greater number (91%) of Muslims and absence of a single Hindu female were among other factors ascribed to exposure to dusty winds specially during seasonal corn gathering. But the evidence in support of this view is not conclusive ; for those who regard asthma as an anaphylactic phenomenon so often base their views, among other things, experimentally on what happens in guinea-pigs, that it is well to emphasize that these animals are the only ones, which are susceptible to asthma as a feature in anaphylaxis. Those patients who react (about 50%) usually do so to several substances and it is not necessary to be an asthmatic to react. It is suggested that various foreign substances found in the dust pollen, fungi, hairs and the like, may in the supersensitive induce considerable irritation or stimulation of the fifth nerve endings in the nose and this is all that is necessary in an asthmatic patient to initiate an attack. Storm Von Leuden adopts this principle in his treatment of patients of which an important part is sleeping in dust-free atmosphere; he regards skin reactions as of little significance and he desensitizes his patients by shock tactics with the injections of sulphur, milk and tuberculin.

Many may be sensitive to the skin and nasal stimuli but few are asthmatics : a *neurotic factor* is also required. Hurst defines asthma as a reaction of an over-excitable bronchial centre.

Asthma is a mild form of shock affecting the respiratory system and the nature of these manifestations of disease does not differ from shock occurring elsewhere in the body. Shock is dependent upon two factors :—(1) A precipitation of colloid protein particles in the vessels of the organs involved. (2) A loss to the organ of oxygenated blood. These factors working in the brain give rise to migraine, epilepsy, eclampsia, coma, etc., in the skin to angio-neurotic œdema, urticaria, in the systemic

circulation, to status lymphaticus and tetany and when occurring in portal circulation, to vomiting and diarrhœa.

Hydration of the protein particles in the plasma is hereditary and this renders asthma and hay fever merely manifestations of inherited disease. The main result inherited is mal-co-ordination, which for description is divided into mental and physical. Mental mal-co-ordination results in vagotonia and physical in misuse of body as a whole. Vagotonia causes trouble in the colon and misuse of body interferes with the proper functioning of the intra-thoracic viscera. Familial chronic intestinal intoxication is the main precipitant of the manifestation of inherited disease because it is being continually aggravated by faulty dietary and inadequate elimination. B. Coli Communis is changed into a pathogenic type which is non-lactose fermenter. The abnormal bacilli break down food into certain bodies which circulating in the blood stream cause dehydration or augment dehydration. There may be other precipitants, but these are always secondary to a familial chronic intestinal intoxication ; hence explaining why removal of secondary foci of intoxication, *e.g.*, nasal, dental, tonsillar and urogenital, never more than ameliorates the clinical manifestation presented. Hyper-sensitiveness means augmented hydration and removing the agent causing the same, does not get rid of the factor which sets the original hydration in motion. It is for this reason that skin tests are valueless based as they are entirely on false bases.

Asthma with all its vagaries is primarily a toxic condition. This view is based upon the following clinical facts.

1. *Periodicity* :—Week-end periodicity common in working folk occurs in 60% of cases being connected with overfeeding and under exercise of the week-end. Due to week-end idleness there is imperfect nitrogenous metabolism as indicated among other things by the frequent deposits of urates in the urine. It is not confined to asthma alone as epilepsy, albuminuria and angio-neurotic œdema are a few more week-end affections.

2. *Nocturnal Periodicity* :—Asthma attacks are common between 2—4 A.M., the time of so-called ' acid tide '. Frequently, attacks occur on waking.

3. *Sallow skin and cachetic appearance are common in Chronic Asthmatics* :—This indicates a toxic state probably connected with adrenalin defect and often disappearing together with improvement of the asthma with effective detoxication.

4. 25% of asthmatic children suffer from skin affections characterized by itching and reckoned as allergic. But generally

these children also suffer from recurring bronchitis, laryngitis etc., and many workers regard them simply as due to general toxic state. They are cured largely by attention to diet.

5. *The striking series of Asthmatic cases cured by the War*:—The strenuous life and not too generous feeding of the army cured many asthmatic men, who found asthma recur on their return to the safer conditions of civilized life and who again became well by attention to diet and open air exercise.

6. *Vicious effect of mouth-breathing*:—The asthmatic children are curable if proper attention is paid to diet, bowels, open air games and a weekly mercurial provided they are not mouth breathers.

Hypochlorhydria.—A certain number of asthmatics are found to suffer from deficiency of hydrochloric acid and administration of acid has benefited them. Only one (3%) case in the series reported did well under hydrochloric acid per mouth.

Hepatic Dysfunction.—Barber and Oriel have found an increase in the non-protein—N amino acid contents of the blood and have found a proteose-like substance in the urine of patients during asthmatic fits. According to them *hypochlorhydria* and hepatic dysfunction are associated with asthmatics. There is an abnormal disintegration of proteins and the liver is not able to deal with them, they thus gain access to general circulation and ultimately are passed through urine. These substances after separation, are used by them for both test and treatment. They use the following method for separating proteose-like substances from urine :—

Take 400 c.c. of urine, acidify it with sulphuric acid, add to it 100 c.c. of ethyl-ether, shake it well in a separating funnel. Let it stand—the urine and ether will separate in layers. Now ether will become turbid if the urine contains the proteose-like substances. After separating ether, add an equal volume of ethyl-alcohol. The proteose will be precipitated. Wash the precipitate several times with saline filtered through Berkefeld filter, sterilize and dissolve it in Coca's solution. (Nacl 0·5 ; NaOH 0·79 ; CHOH (Phenol) 0·4 and water 100 c.c.) Dose—One in a million solution is used for scratch or intradermal test or for desensitising.

Malaria.—The asthma may be due to latent malarial infection and (21·2 %) seven persons had enlargement of spleen. Three of them responded to proper treatment. One case seen on

6th May 1931, had complete cessation of attacks after three intravenous injections of 10 grs. of quinine.

Other intrinsic factors responsible for the spasm are pathological conditions of the digestive tract, septic teeth, tonsils presence of latent amœbiasis and infective conditions of gall-bladder, septic condition in the pelvis and visceroptosis, pathological conditions of respiratory passages, infections of naso-pharynx, sinusitis polypi of nose, urogenital sepsis condition of prostate in male and fallopian tubes in female, ovaries, uterus and vagina may be investigated. Diseases of perverted metabolism such as diabetes mellitus unknown to sufferer have caused symptoms like asthma. In a case reported the patient had complete cessation of attacks within a very short time on insulin injection and since then had no recurrence.

Diagnosis.—It will be seen from the above paragraphs that asthma is a syndrome and not a disease as it is not the result of working of one factor but to multiplicity of factors. The treatment depends upon the accurate findings of the cause or causes. This will require the acumen and pertinacity of a super-detective. He can only expect to come to the causative factor or factors by the slow process of elimination, scratch and intradermal tests and careful consideration of clinical history. The following routine is recommended :—

1. *Onset*:—History of the first attack ; age. To what cause was it attributed ? What was the line of treatment adopted and with what results ?

2. *Cause*:—What causes the attack, *e.g.*, inhalants, foods, drugs, emotions and bacterial infections.

3. *Duration*:—How long has he been getting the attacks ?

4. *Season and time*:—When does he get the attacks—winter or summer ? During the period of corn gathering or when certain pollens mature? When do the attacks start ?—early in the morning, during day or at bed time ? What connection, if any, the attacks have with the principal meals ?

5. *Periodicity*:—Do the attacks occur at certain periods, *e.g.*, week-end or full-moon or in the last days of lunar month? How often do the attacks occur ? Is there complete freedom between attacks ?

6. *Locality*:—Where does he get the worst attack ? Is it in his house or in his office, in the town or in the country or near the sea-shore ? Is his residence situated near a factory ? Does he sleep in the proximity of some animals ?

7. *Personal History*:—Has he suffered from any of the disease *e.g.*, malaria, dysentery, diabetes, etc.? What are his idiosyncrasies, etc.

8. *Habits*:—When does he take his last meal? Where does he sleep? Does he use a feather bed or feather pillows? Does he take exercise regularly? Do his bowels move regularly? Does he suffer from indigestion?

9. *Sputum*:—The colour of sputum.—Is it mucous and sticky; grey or frothy (common in asthma)? Is it fœtid, yellow or greenish, met with in bacterial infection?

10. *Treatment*:—What treatment gives him maximum benefit? Is it injection, if possible, of what? How is the attack controlled—injection, spray, smoking or any drug?

11. *Personal observations*:—His personal views about the attack and why he gets them? How he gets the best relief?

Physical Examination.—Examine the nose; one may find in some cases hypertrophy of one or both the middle turbinates, polypoid out-growths from this body or from ethmoidal cells coming in contact with septum, or else deviation or swelling of the upper part of the septum meeting with the turbinated body. In children nasal complications especially the enlargement of middle terminal will often be found. Typical chest deformity of asthmatics is easily recognized. Measure the chest at the fourth rib and the epigastrium and note the expansion. Mark the type of breathing—thoracic or abdominal. Sallow skin and cachetic appearance and boggy nasal mucous membrane of the marked allergic cases are also striking. Exclude such ailments as mitral stenosis, uræmia,carcinoma of lung and failing left heart—cardiac asthma also to be excluded. If severe asthma accompanied by fever is not responding to proper treatment, it is probably not true asthma but a case of acute bronchitis with broncho-spasm.

Types of Asthma.—The asthmatics can usually be grouped under one of the following clinical types:—

1. *The Sensitive or Allergic type*:—50 to 60% of all cases give dermal reaction to protein and this does not appear to vary. Clinically they give positive family history; probably attacks dating from childhood; inhaled or ingested substance causes the attacks; frothy sputum and low gastric acidity.

2. *Type of Reflex Asthma*:—Many of the severe types of asthma are greatly assisted by cauterizing the nose, that is to say, the lower turbinals, the septum and the middle turbinals. Test the mucous membrane in all cases with probe covered with dry wool. By this method spots which are especially sensitive to the touch can be discovered, the patient may sneeze, the eye of that side may water, or more important still, the patient may immediately cough. In other patients in whom a tickling cough initiates an attack of asthma, similar sensitive spot may be found on the pharynx. Gastro-intestinal disturbances, the presence of worms, or any other septic process in the abdomen or even a simple purge have been known to have caused asthma.

3. *Bronchitic type*:—The first attack commonly occurs in people past middle age, with a history of chronic bronchitis and colds usually worse in the winter months: purulent sputum during the attacks. Autogenous vaccine made from the sputum offers great relief.

4. *Periodic type*:—Attack comes in cycles taking 3 to 4 months to run its course with healthy interval for a month or so.

5. *Neurotic type*:—In highly nervous people the attacks are associated with worry or emotion: quite a trivial stimulus such as smell or crowded rooms, may provoke an attack.

6. *Nasal type*:—Rather naso-pharyngeal type—sensitive nasal mucous membrane with much sneezing and rhinorrhœa, gross nasal diseases, sinusitis, enlarged tonsils or posterior cervical glands very frequently give rise to asthma.

7. *Drug-sensitive type*:—Aspirin-sensitive type is most common. The asthma attacks come after aspirin is taken or are more violent. Almost all aspirin-sensitive people have polypi in their noses. Removal of polypi cures or abates the attacks. Cocaine, quinine, antipyrene and other drugs have been recorded to give rise to attacks.

8. *Menstrual type*:—Comes with advent of menstruation. Many of them are free during pregnancy.

9. *Week-end type*:—Occurring at the end of each week or a period of rest.

10. *Adams' toxic type*:—Long history, sallow, muddy complexion, thickened and eczematous skin, pale and boggy nasal mucous membrane, skin tests positive to many substances, long standing dyspepsia, are the main features of the toxic type of asthma.

11. *Other types*:—Seasonal types; climatic types; others associated with high blood pressure, skin diseases *e.g.* eczema; malaria, diabetes.

Treatment of the Acute Attack.—1. *Drugs*:—Adrenalin 1 in 1000,5 to 10 m. injected subcutaneously rarely fails to give relief.

The site of injection should be massaged by the patient. If no relief is obtained within 20 minutes, the injection may be repeated. Evatmine (pituitrin and adrenalin) is sometimes successful when adrenalin alone fails. Caffeine, sodium salicylate gr. one may be injected along with the adrenalin and is often useful. Other drugs such as atropine and hyoscine though useful, are not much thought of now, as adrenalin if properly prescribed and in sufficient dosage is far superior to them. Heroin and morphia are advocated by many, but they should be given with caution as they depress the respiratory centre. The following solutions are recommended.

(1)	℞	Morph. Sulph.	...	gr. 1/4
		Atropine Sulph.	...	gr. 1/100
		Adrenalin	...	1 c.c.
(2)	℞	Codiene Phosph.	...	grs 2
		Apomorphine	...	grs 1/4
		Adrenalin	...	1 c.c.

3 to 5 minims of any of these solutions are injected and the needle being left in situ, 1 to 2 minims may be repeated every 5 minutes, till relief is obtained. In some cases it gives rise to cardiac symptoms such as palpitation and vertigo, hence it is not very popular. If no relief is obtained within 20 minutes, it is probable that asthma is associated with bronchitis or possibly membranous bronchitis. In such cases Caffeine sodium salicylate gr. 1 given subcutaneously gives relief. Caffeine Iodide has been favourably reported upon by others. If there is no relief still, as it happens in status asthmaticus, the needle of the first injection is left in situ and a minim of adrenalin is injected every minute till relief occurs or a total of 1 c.c. is given. Hurst recommends an insertion of needle in vein and minims 2 injected every 3 minutes to a maximum of 15 minims in all. Waldbott writing recently on the treatment of Asthmatic crisis, thinks that the condition may result in temporary amelioration or death. He considers status asthmaticus as an allergic shock. This is the climax of chronic state of asthma. The death may be caused by asphyxiation due to the blocking of the bronchi by thick tenacious mucus or may be due to formation of œdema in alveolar spaces, heart failure playing a minor part. The management of a case of status asthmaticus consists of: (1) Elimination of antigens. (2) Avoidance of harmful antigens. Adrenalin or Ephedrine may be discontinued for the time being. Enema of salt and sugar is recommended and soap and water enema is

prohibited. Treatment consists in putting the patient in a dustless atmosphere, where possible, and giving barbiturates and avoiding narcotics. The cyanosis may be combated with oxygen and corbondioxide inhalations. 100 c.c. of 25 to 50% solution of glucose by vein, is given.

2. *By Mouth* :—Ephedrine gr 1/2 to grs 2, or Euphazone one to two tablets are useful. But it has some unpleasant side-effects as many patients complain of tremors, nervousness, insomnia and sense of suffocation. It is to be prescribed with caution. Recently, derivatives of Theobromine and Paraphylin have been recommended. Mercurial diuretics are said to yield good results. Felsol (A.F.D.) powders are certainly useful and asthmatics may confidently be advised to keep the stock ready at hand. The following mixture is found to give good results.

	℞	Pot Iodide	...	gr. 7½
		Tinc Stramonia	...	♏ 15
		Tinc Lobelia Aetheris	...	♏ 15
		Tinc Camphor co	...	℥ 1
		Spirit Ammonia Aromatic	...	♏ 20
		Aqua ad	...	ℨ 1

Mft mist. Sig one dose every four hours till relief is obtained.

3. *By Inhalation* :—Modern view is aganist the inhalation of remedies in the treatment of asthma for the following reasons. First, the basis of many inhalents used for spraying the nasal mucous membrane is cocaine in 0.5% solution dissolved in ol Gaulthria or some suitable solvent and atropine in strength of 0.05% solution ; secondly the effect of repeated inhalations, if indulged in for a long time, on asthmatics is very injurious. Parke Davis & Co., have marketed Adrenalin 1 in 100 solution, which has been used with success as a nasal or throat spray. Benzendrine, a synthetic preparation has been recommended for smelling. On the Continent, the following solutions for inhalation are very popular.

1. *Tuckers Spray*:—Cocaine 0.5% forms the main ingredient and is a valuable palliative.

2. *Bronchovydrin* :—Consisting of papaverine, atropine, nitrites and adrenalin, is useful in cutting short the attack. A pocket atomizer is used.

3. *The Apneu inhaling machine*:—In this machine a special atomizer is fitted to a cylinder of oxygen, and a very fine, cloudy

vapour of watery or oily solution or a mixture of both, is obtained. Many drugs are used in the atomizer but adrenalin 1 in 100 mixed in pine oil is recommended. At the onset of attack the patient turns the vapour himself and is undoubtedly the most valuable palliative. But its cost and bulk are both great drawbacks and is rarely used in our country.

The smoking of Stramonium leaves is said to afford relief and is tried by many.

Treatment between the Attacks.—The asthmatic is admittedly a person of neurotic type. Hence his mental and nervous condition has a big bearing on the problem of treatment. For, the repeated asthmatic attacks, by preventing proper sleep, proper exercise and ordinary pleasures of life, make a nervous wreck of the patient. In fact the patient lives in constant dread of the next attack. The treatment is to aim at decreasing the severity of attacks and enlongating the period in between the attacks. For this an intelligent co-operation of the patient is absolutely essential. The patient is instructed to maintain the record of the attacks, with the details and the time of the attacks. Any predisposing cause or causes and the diet are carefully entered.

Personal Hygiene.—He should be impressed with the laws of hygiene and the cleanliness of body and mind is to be observed. He is to take tepid bath daily in the morning, followed by an hour's exercise such as brisk walking. He may devote ten minutes to expiratory breathing exercises in the morning and in the night, preferably in the open or before an open window. At week-ends as much time as possible is to be spent in open, and fresh air exercises.

Surroundings.—A visit to the patient's house, especially that of city-dwellers, will often pay. The bed room is to be carefully and thoroughly gone through, unnecessary articles thrown out, the bed to be put near the window, a search for a possible causative factor undertaken, pillows of feathers be replaced by clean cotton ones and the proximity to any animal including pets be forbidden.

Diet.—The teeth be looked into. The diet should consist of vegetables and fruit and should be plain and nourishing. No fried article is allowed. Certain items of food such as shell and other fish, meat, egg, and even vegetable proteins are often found to be responsible for evoking an attack of asthma in persons sensitive to them. It has also been observed that in

certain cases, a single article in the above named list often fails to induce an attack but when combined with others does provoke an attack. The last meal should be taken before sunset. Two principal meals are advised, over-eating is forbidden. Any special article which the patient knows will produce an attack, should be excluded. One day of starvation in a week, when only a small quantity of fruit is allowed, is advisable.

Elimination Treatment.—Rowe first advocated treatment by elimination diets. At the onset of attack, if the patient is not exhausted, an emetic, ½ ounce of Vin. antimoniale or 1/10 gr. of apomorphine is given. Especially in children an emetic is useful. He is to be starved for full 48 hours, fruit juices, glucose and weak tea only being allowed if asked for. Calomel in the night, followed by a saline in the morning cleans the bowels. He may be put to bed. His first meal should consist of such articles as by experience the patient knows to be harmless, that is, those to which the patient is not sensitive. Subsequently one item of food is added, till there is reaction. When certain number of articles are associated with the attack, any of the following two tests may be done for confirmation.

1. *Prausnitz-Kustner reaction*:—Remove aseptically two c.c. of blood from a vein of a patient. Inject 1/10th c.c. of the serum intradermally in a healthy person. Two hours later the suspected article is given to the latter or extract from it is used as scratch test.

2. *Leukopaenic Test*:— This consists of undertaking two absolute leukocyte counts at intervals of 15 minutes, on the starving patient. Administer the suspected article to the patient. An hour later, three to four counts at intervals of 30 minutes are done. A fall of over thousand per cmm is taken as positive.

Climate.—The change of climate often does good. Generally, 3500 to 6000 ft. altitude suits most asthmatics. But in this as in diet, personal idiosyncrasy is very marked. The same climate may not suit all.

Breathing Exercises.—The value of breathing exercises in the therapy of asthma is but dimly appreciated both by the physician and the patient. It is believed on the Continent that 50% of asthmatics are freed from symptoms by daily use of these exercises and about 35% more could be enormously benefited. The Asthma Research Council has published a booklet (Remedial breathing exercises in Asthma) and suggest the following aims of the remedial breathing exercises, (1) To acquire the habit of

automatic diaphragm breathing at the expense of the thoracic type of breathing. (2) To habitually concentrate on complete expiration rather than on inspiration especially at the onset of an attack. (3) To increase the mobility of the chest wall and to relax the accessory muscles of respiration. (4) To correct any deformity present *e.g.* kyphosis etc. common in asthmatics. The acquirement of technique is not so simple, as it appears. He can nevertheless acquire a reasonable efficiency by perseverance. The test for knowing whether the patient has mastered the technique is that the patient should be able to expand the chest at least 2½ inches at the fourth rib and 2 inches at the epigastrium. The great thing in this is that the patient feels that he is doing something for his cure and if he is able to abort an attack by doing this simple expiratory exercise, he gets an enormous amount of self confidence and this counts a great deal in curing the disease.

Specific Desensitisation.—This treatment based as it is on the ætiology of asthma caused by allergy, when first introduced, held very high hopes but soon it was found that in practice it was both inconvenient to the physician and the patient involving not only labour but expense also. Besides, great care is to be taken in dosage as otherwise the injections made in this method may cause unpleasant symptoms. The allergens have been divided into two groups, bacterial and non-bacterial.

The bacterial allergens are recognized by the presence of some infection *e.g.* infected tonsils, chronic bronchitis etc. somewhere in the body. Besides, blood examination will show leukocytosis. In some asthmatics, Friedlander-like bacillus has been isolated from sputum and in some of these cases autogenous vaccines, have been reported to have yielded good results.

The non-bacterial allergens:—There is a group of people who are sensitive to substances from which they cannot be removed. To give an example, a fisher woman is sensitive to the smell of fish, or groom is sensitive to horse dandruff. In such cases, this treatment holds out good promise. Often one comes across certain number of people who are sensitive to common articles of diet, such as wheat, milk, eggs, vegetable proteins, etc. and these articles cannot be easily excluded from diet. When after scratch and intradermal test the offending article is found, the patient can be treated by injection of increasing doses of a solution made from the substance, at frequent intervals. The reactions could be minimized by the addition of 0.3 c.c. of adrenalin in each

dose. The injections are to be continued until the patient's skin no longer reacts to the antigen. It would be only possible to carry out this treatment in institutions which are well equipped for this purpose.

Non-specific Desensitization.—The following methods are used with some degree of success.

1. *Milk Injection*:—Whole milk is injected intramuscularly (1 to 10 c.c.) in gradually increasing doses. One case out of 18 cases was greatly benefited in my series reported. Aolan is popular with many.

2. *Peptone solution*:—5 to 7½ percent, with initial dose of 0.3 c.c. gradually increased to 1 c.c. every third day injected intramuscularly till half a dozen injections are given;then increasing the interval to 7 days has given very good results. 5% solution by intravenous route is also effective. In powder it could be given gr. 10 in cachets one hour before each meal t.d.s.

3. *Auto-hæmotherapy* :—Blood is drawn in a syringe from a vein in the arm, during an attack or otherwise, and 5 to 10 c.c. are injected immediately into the buttock muscles, on alternate days in the beginning. Then slowly increase the dose. Also increase the interval to seven days. In the writer's hands it has not yielded good results.

4. *Sulphur*:—One to two c.c. of 1% suspension of sulphur in olive oil is recommended by Van Leeuwen for intramuscular injection. The injection gives rise to local inflammatory reactions, malaise and headache. The initial dose may be 0.5 c.c. and may be gradually increased. The interval between the injections is 6 to 7 days.

5. *Collosol Manganese*:—It is also tried.

6. *Typhoid Vaccine* (*T.A.B*) :—Intramuscular injection of typhoid vaccine containing one thousand million B. Typhosus and 5 hundred million each of para A and para B per c.cm. Three injections of 0.25 c.cm. 0.5 c.cm, and 1 c. cm. at weekly intervals are given.

7. *Tuberculin* (*T.O.A.*):—Van Leeuwen advocates this in doses commencing with 0.1 c. cm. of one in million stength, and doubling the dose at biweekly interval until a local reaction is produced ; then increasing at weekly intervals by 20%.

8. *Mixed B. Coli Vaccine*:—It is made from all types of B. coli found growing in the intestines. It is said to be very effective by some workers.

9. *Gold salts:*—Sanocrysin is now used in doses beginning with .01 grammes, to be repeated at an interval of one week, with increasing doses, till a dose of .25 grammes is given. The total quantity of the salt administered should not exceed 2 grammes for a course. Banszky attributes the benefits derived from these salts to their general tonic effects.

Treatment by drugs.—Iodides are the oldest in the field. Mixture consisting of Pot. Iodide and Tinc. Stramonii suggested above is found useful. Addition of Liq. Arsenicalis to the mixture makes it more effective. A tablet of ephedrine or euphazone taken in the night is helpful, but should be gradually discontinued as soon as the patient begins to get good nights. This mixture has been found useful for those who suffer from fullness after meals, flatulence and mild eczema.

℞	Acid Hydrochloric Dil	...	♏ 30
	Glycerine Pepsin	...	♏ 60
	Calcii Chloride	...	ʒ 10
	Aqua ad	...	℥ 1

Sig to be taken in full glass of water, flavoured with orange juice and sugar, as a drink with meals three times daily.

Summary of Treatment.—It has been abundantly made clear that no universal treatment has so far been evolved which may be effective in the cure of asthma. The recent researches have gone a great deal ahead in the elucidation of etiology of disease and it is hoped that in the near future our efforts will soon be met with success. At present, a great deal could be achieved by attention to small details and close enquiry into personal history. I have found in confirmed asthmatics that light cauterization of the septum of the nose doing enormous good. Vaccines in Bronchitic Type of asthma are definitely useful. Stock vaccine of Parke, Davis & Co.'s bronchial asthma (mixed) vaccine containing about 80 million mixed organism per c. cm. is useful. In infants and children with asthma accompanied by eczema or prurigo, it is useful to eliminate in turn milk, wheat and eggs from the diet. Those children who are sensitive to milk, Cow & Gate's allergilac dried milk may be substituted. Investigation by skin protein test, in Adam's toxic type of sufferers be carried out and the course of desensitizing injections with a mixture of the proteins to which the skin gives the most marked reaction may be given.

Some Drugs and Other Agents Useful in Modern Treatment

BY

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THE last decade legitimately claims to have such extensive record of improved methods of treatment by drugs and other agencies that difficulty lies not in having to find the material but in compressing the available material in the alloted space.

There are many chemical and pharmaceutical concerns growing now-a-days (though this is not an unmixed advantage) which, with the old ones, vie with one another to find out various chemical, biochemical, vitamin and other products, or improve on the existing ones. The consequence is that the medicine man is armed with many more potent drugs and means today than a few years ago.

In the following lines, I will be able to sketch some of these modern agencies of treatment.

Prontosil deserves the first mention as almost the most important and efficient of the recently discovered remedies. The medical profession, in any branch where recognition to the potentialities of the Streptococcus Haemolyticus has to be given, cannot too much thank the discoverer of this chemical.

Really potent and effective drugs are sometimes likely to be misused. The doctor wants to prove or disprove his tentative diagnosis by obtaining therapeutic evidence obtained by the use of such a drug as sulphanilamide. I should like to warn these doctors that the prontosil *i.e.* sulphanilamide is a potent drug-potent to do benefit as well as—if indiscriminately used—harm.

Urine and Blood must be previously examined in every case where this drug is to be used. Idiosyncrasy of the patient should be studied by small doses before full dosage is used, and during its exhibition the patient should have sulphur-free diet and drugs.

The drug is also used with considerable success in the M. Melitensis infection which is so crippling and so long drawn out.

Cases of B-Coli Pyelitis are benefited by prontosil and meningococcal infection has also been treated with this drug and successful results reported.

Latterly Infective Endocarditis has been added in the list of diseases where this streptocide has been effective. In the near future many more potentialities will be worked out to the great benefit of the sufferer and to the great satisfaction of the doctor.

Uleron—Claimed to be an equally efficacious specific against gonococcus has yet been too short a time to have definite opinion on it but personally I find it difficult to believe that it is to gonococcus what prontosil is to streptococcus. Prontosil has also some recognisable action on gonococcus and B. Coli particularly when the latter settles in the pelvis of the kidney.

Mandelic-Acid Treatment of the B. Coli Pyelitis:—Though the dose requires regulation by ascertaining the pH. of the urine, is fully worth all that trouble as it prevents recurrence so often met with in this disease. Many preparations are now made which are more easy of administration and fairly effective.

Ketogenic diet has been a successful remedy in the B. Coli infections of the urinary tract but the Mandelic acid treatment has well replaced it. The Ketogenic diet in the treatment of Epilepsy has been tried. In some cases the interval between the fits has been lengthened but it is so difficult to anticipate the exact date of the fit and therefore to determine when the Ketogenic diet could be left off without fear of recurrence of fits. In Epilepsy a combination of Calcium Gluconate and Parathyroid intra-muscularly twice weekly has been a very encouraging treatment in the writer's hands and it is much easier to give than the Ketogenic diet particularly to the vegetarians.

Thyroid Gland has been the oldest and one of the most efficient Hormonic medications orally administered. It has varied uses. In chronic parenchymatous Nephritis and Nephrosis it is very useful. With some Calcium chloride in mixture form and thyroid, one finds pleasure to see the oedema recede day after day. The writer adopts the practice of weighing the patient every day while under this treatment and has a very correct estimate of its efficacy by the help of the balance. Cal. Chloride alone does not give reduction of weight as with the thyroid in combination.

The treatment with thyroid and Pot. Permanganate in all chronic sepsis can be recommended and similarly thyroid is a useful drug in skin condition like Eczema and Psoriasis on the same grounds of detoxication.

In acute infections like Pneumonia, I have used thyroid and Pot. Permanganate but the disease being more or less self-limited I could not assess correctly the value of the treatment.

Pneumococcal Vaccine has been recently reported very favourably in Pneumonia, but it is to be used early in the disease to have best results and in this country it is rare to get cases before 3 or 4 days, after which the patients usually find it difficult to avoid medical attention.

Mercurochrome with Glucose has very recently claimed a 'cent-per-cent cure' for Pneumonia. The dye has been used in acute septicaemic infections like Typhoid and therefore its use in Pneumonia is very rational.

S. U. P. 36 Solvochin, Transpulmin, etc. have been used in the treatment of Pneumonia. I preferred at one time to use S.U.P. only in an attempt to assess its value. I used it in many cases with the temperature chart changed for the better after its administration, and with subjective improvement but without any noticeable alteration in the physical findings.

There was a time when a case of pneumonia could not be said to have been well treated without a thick *Antiphlogistine* jacket. It acquired fame because the disease happened to be self-limited in more than 90 per cent of cases. I am sure no case of pneumonia has died because antiphlogistine has not been applied. However the poultice has proved its value in many local minor surgical diseases like boils and carbuncles or whitlow. Many of these lose all their severity and annoyance if dressed with antiphlogistine and they may even resolve entirely without the surgeon's bistuory and all its sequelae.

Carbuncle is a disease from the treatment of which the surgeon who can only wield knife should better retire and which should now claim the attention of one who practises medical Radiology and Electricity. Superficial *X-rays* once or twice weekly on the carbuncle are a very effective remedy and not to use it would be considered a negligence by those who do use them. Short wave therapy has been also put up as a cure. In diabetic carbuncles, *Insulin* has to be used along with X-ray treatment given locally.

While discussing Diabetes, a reference to the new type of Insulin will not be out of place. It has a delayed but prolonged action. In Coma, therefore, where rapidity of action is essential, this protamine zinc Insulin is not to be trusted, but in ordinary diabetes, it is very useful and effective. It mimics natural

secretion of insulin by the Pancreas in as much as it is slowly and continuously absorbed from the site of injection where it is as it were stored. In the cases of diabetes where both rapid and delayed and prolonged effect is required as found out by the contents of sugar in the blood or urine, ordinary insulin can be mixed with the protamine Zinc Insulin in the same syringe and given to fulfil the requirement.

Intra-venous Glucose alone or in combination with drugs, like urotropin, mercurochrome etc. is a medication of choice in many conditions. Hypertonic 25 % or 50 % Glucose intravenously was shown to be efficient in bringing down intra-cranial tension. As it was used more and more, its value in all states of toxæmia became more known and now its use is made in infections as well as toxæmias. With a small minority of patients unexpected reactions followed the intra-venous administration of Glucose. Even after reaction, there is usually a feeling of improvement on the part of the patient. In one case only—(and I have used by now in very many) death occurred within a few hours of the exhibition of intravenous glucose and in that case the glucose was given to him for the first time and no other cause could be found to account for the fatal result.

Some doctors believe that Glucose given in this way *i. e.* 25 or 50 c. c. of 25 % will supply nutrition in conditions of starvation induced by disease. I think it is not a correct view because the amount of glucose given would not be even half an ounce and would not give more than 50 calories of heat. The Glucose may be bio-chemically important but in such small amount it is not so from a nutritive point of view.

Intra-venous glucose is used in angina and also in coronary Thrombosis.

In Cardiac Decompensations—apart from the Coronary Occlusion, *Salyrgan and Novurit* have proved to be worthy of the confidence put in them. Novurit suppository is a convenient method, as it does away with the needle prick, but in our climate it does not keep well and therefore rectal irritation follows its application. However it is given as intra-muscular injection quite well and efficiently.

Euphyllin is a valuable drug where decompensation is behind hypertension.

In cases of repeated attacks of Cardiac decompensation in which the cause of decompensation is not easily detectable *i. e.* there is absence of valvular disease, coronary disease, syphilis,

rheumatism, gout, essential hypertension, or thyrotoxicosis, one possibility has to be borne in mind and that is masked Beri Beri *i. e.* Vagal neuritis. Such cases clear up rapidly on administration of *Betaxin*.

This Vitamin 'B' preparation has been a successful one in neuritis. It cures Beri Beri and helps many other types of neuritis.

Redoxon and Canton i. e. the Vitamin 'C' preparations are very efficacious in scorbutic conditions. That they are useful in acute infections like Pneumonia and Typhoid has yet to be proved.

In Typhoid fever, diarrhœa, which no doctor thinks it an unmixed advantage to check, particularly when associated with distension, is a symptom that taxes any medical man. *Collo-argentum* in drachm and two drachm doses, is a very useful drug. It acts as a mild antiseptic and astringent and therefore controls the diarrhœa by soothing the mucous membrane without inducing further distension as might follow the use of Bismuth or Opium.

For distension of abdomen in Typhoid fever, one good remedy is a small low-pressure enema of *normal saline* gently administered. The saline should be at a temperature of 45° C and the efficacy consists in its being so hot. It reduces the tympany well.

The number of new hypnotics has increased considerably and is yet increasing. In this realm, I regret, I am not much modernised. My respect for Hyoscine, Chloral, Sulphonal and Paraldehyde—all old drugs—has increased rather than decreased after a trial of the newly discovered preparations.

The use of *Sod. Chloride* in Addison's Disease with cortical extract is a proof of the acknowledged dictum, that kind Nature fixes the prices of any material in inverse proportion to its value as a necessity of life. We have to pay nothing for air, very little for water and much more for food because we can live without air only a few moments, without water for a few hours and without food for a few weeks.

Sod. Chloride is used in diphtheria along with the antitoxin and the general condition remains better with the saline than without. About one and a half drachm of Sod. Chloride should be administered in 24 hours.

Similarly *Pot. Chloras*—a very simple chemical, is now put up as a very valuable chemotherapeutic agent for anterior

poliomyelitis. 5 to 10 grains for children and 30 to 40 grains for adults per dose should be given. A two per cent. solution of the same is used as instillation in the nose two or three times a day.

For Acute Appendicitis, the trend of conservative treatment in acute stage is gaining favour. Stoppage of all food and drink to ensure rest to the inflamed part and intravenous administration of *Glucose and Saline* to supply the water and salt needed, is a very successful method which helps to tide over the period attended with great risk of operation which has to be performed later on in safe period.

Idiopathic Sciatica has lost its severity in a large percentage of cases on account of the Epidural injection of *Saline and Novocaine*. There is no necessity for general anæsthesia for the epidural injection which can be painlessly carried out under local anæsthesia. Laterally, I give, as a trial, injections of *Camphor-salyl* intra-muscularly one everyday or alternate day for 4 to 6 injections in cases of sciatica and in half the cases, the need for Epidural injection does not arise at all. After a few months, recurrence of sciatica may take place when the same drug can be used. If recurrences are frequent epidural injection becomes a necessity.

One important agent in the treatment is *auto-hæmotherapy* on account of its simplicity, harmlessness and cheapness. It is one of the most effective remedies in allergic skin conditions. Similarly the writer has found it of great value in hæmorrhagic conditions. My first case treated with this method is a striking instance. A young man with pulmonary and pleural tuberculosis, while undergoing treatment, suddenly developed blurring of vision in both eyes. On examination, small scattered hæmorrhages in both retina were detected. Next day the vision became worse and more hæmorrhages were found in the retina. Out of mere helplessness, auto-blood was given (5 c. c.). The vision improved a little; 2 days later, 10 c. c. of auto blood were again injected. This injection was also followed by further improvement and encouraged by the result, 6 more injections were given when all the hæmorrhages were absorbed and full vision was restored. I have since then used auto-blood injections in retina hæmorrhages and in cases where nephritis is not the cause, good results of various degrees of improvement have been obtained.

Similarly in pernicious anæmias, where *liver extract preparations* have not improved the anæmia, I always try autoblood with or without liver extract, and in certain number—not in all—improvement begins to appear after 2 or 3 doses of the autoblood. In such cases subsequent doses of liver extract required have been fewer when they are helped by autoblood than without the latter. One case having improved presumably on autoblood with liver extract and not on latter alone, relapsed and came under treatment again. Liver preparations were given as long a trial again without any benefit, and then autoblood was given without liver extract, when benefit was noticeable after 2 injections. This cannot be called only a coincidence for this particular case at least. The autoblood has been tried by me in essential hypertension. The usual doses begin with 5 c. c. and gradually increased to 15 c. c. once every 4 to 7 days. Regular readings of the blood pressure show that the pressure does not go down; but some subjective symptoms e. g. bouts of headache, giddiness etc. improve. In those who have periodic bouts, the periods of freedom from them become longer. Some treatment is yet to be worked out for hypertension. It is an important ailment for which we have ample time to work and yet we are entirely helpless.

Having read in a journal of neurology about the value of auto-blood in sudden apoplectic attacks, I try the method in cerebral hæmorrhage, thrombosis and embolism. In the hæmorrhage there has been no benefit in my cases where it has been tried. In thrombosis and in embolisin, if life continues the paralysis clears up more rapidly and to a greater degree more often than not, if the autoblood is administered soon after the onset of symptoms.

The Treatment of Blepharitis Ciliaris.

Wash the eye three times daily with marshmallow or elder-flower tea containing 1 teaspoonful boric acid powder for each glass infusion. Fifteen minutes later the margins of the lid are greased with the following salve: Rp. zinc. oxyd. 0.1—0.2, novocaini 0.3—0.5, vasel. opt., lanol, anhydr. ana 3 gm.—*Journ. d. prat., No. 29, 1937.—Medical World.*

Treatment of Epidemic Dropsy

BY

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In this paper we are concerned with the curative treatment of a patient after he has had an attack of Epidemic Dropsy.

The principles of treatment resolve into the following factors :—

I. The avoidance of the source of infection, as far as practicable
II. Elimination of toxins.
III. Frequent supply of Vitamin B, with the associated vitamins.
IV. Support of heart and general strength.
V. Symptomatic treatment.

I. **Avoidance of the Source of Infection.**—"Infected Rice" theory of Acton and Chopra has given place to "oil theory". In 1929, May, I contributed an article to the Indian Medical Gazette in which I traced the epidemic to adulterated oil. Dr. V. Ghose, M.B., D.T.M., D.P.H., Health Officer, Birbhum, in another article in the same issue corroborates my findings. From the recent epidemic in Birbhum which has been raging from 1938, our idea about oil theory is more and more confirmed. We are now sure about the following points :—(1) An oil may not be *legally* adulterated—but it may be a source of infection. (2) An oil may be highly *legally* adulterated—but it may not cause an epidemic. (3) The mill oil is a source of danger. (4) Perhaps, the danger of infectivity and epidemicity is more acute when there is an incidence of heavy rains.

Hence, to avoid the source of infection, a patient must avoid bazaar oil or the oil from shop wherefrom the infection arose. Jail oil is most reliable. Where jail oil is not available—it is advisable to procure mustard and have it pressed by an oil-man. One would do better if one avoids oil altogether. In my opinion, it is advisable to avoid bazaar-ghee, bazzar oil, tinned meat, tinned foods, canned milk and undermilled and too old rice for a patient who is a victim of epidemic dropsy and who has to live in an area where cases of epidemic dropsy have manifested themselves.

The Scientists use the term "local infection" in cases of Epidemic Dropsy. And acting on the idea that the place of infection plays a part, patients are advised to shun the place and to go to a place of better clime. It is generally seen that victims feel better and have the course of the disease arrested by changing the place of infection. One cannot be certain whether the flying away from the oil or some other food which has been the source of infection, plays a part or whether the change of place has been responsible. But we have seen instances where victims recovering in a place of change have the relapse of the disease, when they come back to the place of infection, even after months, even if victims avoid the oil and rigidly follow the diet that they followed in the places of change.

Hence, the importance of change of climate for victims of Epidemic Dropsy. It is very difficult to choose a place—for individual cases vary just as in tubercular patients. But drier climate, elevated lands and places where congestion is less and dyspeptic troubles are less common, are suitable sites for change. And one should take the first opportunity of leaving the place of infection, provided he can get medical help in his place of change and he is physically able to undertake the journey.

II. **Elimination of Toxins.**—It is generally seen that victims who start the disease with diarrhœa and have frequency of stools during the course have less of œdema and less of cardiac troubles and ocular complications. Acting upon this phenomena, physicians take recourse to elimination in these cases of Epidemic Dropsy by means of (1) Purgatives ; (2) Diuretics ; (3) Supply of anti-toxins.

1. *Purgatives* :—One should keep an eye to the condition of bowels. If there is free elimination—well and good. If not, we must have recourse to examination. For, with the bowels loaded, there is an aggravation of cardiac symptoms and œdema. In simple cases salines are the best eliminators. They may act in the following ways : (1) by their osmotic action they help in the dilution and neutralisation of toxin ; (2) by their purgative action—help the elimination of unknown toxin totally ; (3) probably by their self action they may help the heart from further water logging and thus act as a special cardiac tonic ; (4) in some cases they eliminate by their diuretic action.

2. *Diuretics*:—The secondary damage to kidney from heart occurs in the course of the disease and occasionally primary toxic degeneration in the nature of nephrosis is also possible. Hence

in all cases, diuretics are most useful and can be safely recommended. Good result is obtained with a combination of alkali, Ext. Punarnava Liq., diuretin, urea, scoparin, glucose and sugar. These act by (1) increasing diuresis and by removing extra load from kidneys and heart ; (2) alkalisation of the system altering the portal blood and hence removing the remote chance of acidosis and consequent increased work of the heart ; (3) alkalisation therapy making the system uninhabitable for toxin—which is probably of a chemical nature ; (4) helping the kidney in keeping up the quantity and quality of blood constant and helping the respiratory system secondarily ; and (5) removing œdema. In extreme anasarca and where urine is free from albumin mercurial diuretics such as salyrgan, novurit are most useful. But they should not be used as a routine.

3. *Supply of Anti-toxin* :—As chemical nature of toxin is unknown, we can't supply specific anti-toxin. But in protracted cases where there is resistant type of fever, non-specific protein therapy as omnadin or electargol is most useful. 3 or 6 doses of either occasionally abort the fever.

III. **The Supply of Vitamin B and Associated Vitamins.**—From time immemorial, Vitamin B deficiency was said to be the cause of 'Beriberi'—the wet form of which may be scientifically termed 'Epidemic Dropsy'. We can assume that chemical toxin arising out of consumption of bad oil can act more injuriously when the system has a lack of vitamin B, or chemotoxin responsible for epidemic dropsy has its full play of action when intestinal mucosa suffers from avitaminosis. We know scientifically that vitamin B_1 keeps up the integrity of mucosa of alimentary canal and protects it from any exogenous or endogenous toxin.

As in any deficiency state—the ultimate tissue shortage may be due to : (*a*) defective intake ; (*b*) defective assimilation ; (*c*) defective storage ; (*d*) increased tissue demand from an alteration in rate or type of metabolism. In Epidemic Dropsy, all the factors may come into play. We do not know anything about the storage of vitamin B but it is sure that any chemotoxin damages hepatic cell and liver must be primarily responsible for storage. The question of defective intake is a certainty. But in cases where victims take regularly foods rich in vitamin B_1, the defective assimilation is a factor. Achlorhydria, diarrhœa, and other forms of dyspepsia are serious handicaps to assimilation of vitamin B_1. We have also seen that the curative

dose of vitamin B_1 in deficiency cases is much smaller parenterally than by mouth. As for increased tissue demand from an alteration in rate on type of metabolism, it is a known fact that the requirement of vitamin B_1 is greatest when carbohydrate is the chief source of energy supplied to the tissues and least when fat is being mainly utilised for the purpose. Hence a diet poor in fat and protein but rich in carbohydrate engenders a type of tissue combustion calling for increased supplies of vitamin B_1 and making the person an easy prey to 'chemotoxin' concerned in epidemic dropsy. Here may be found the cause of the greater incidence of the disease among carbohydrate takers.

The sources of Vitamin B for the Epidemic Dropsy patients are :—Brown bread, chappaties, oat, rice gruel, rice polishings, liver, brain, kidney and heart of animals, fish, fat, fish-roe, eggs, unboiled milk, maize, milk whey, butter, channa, peanut, walnut, cocoanut, germinating mung (dhal) and gram, tomato, bean, beet, soya-bean, all green-vegetables as cabbage, carrots, cauliflower, cucumber lettuce, onion, pea, potato, palangsak, radish, opium seedlings known in Bengali as postudehe, papaya, apple, mango, banana, lemon, pineapple, orange, peach, honey, gur—fried rice known in Bengali as Muri. The vegetables and other edibles should be very lightly boiled and a little sauced.

If we want to supplement it in medicinal form—*i.e.*, where palatable cooking has the chance of spoiling the beneficial effects of vitamin B and in certain season and places when and where abundant supply of these is unknown, we may use : (1) Vibex ; (2) Bemax ; (3) Marmite ; (4) Yeastrimonds ; (5) Liq. extract of rice polishings (B. W.), (Smith) ; (6) Yeast vite ; (7) Lyco-yeast ; (8) Dr. Bose's Laboratory's Yeast preparations. We should also bear in mind that just as there is an endocrine orchestra to control the balance of endocrines there is a balance between different vitamins and when there is a lack of one there is lack of all to more or less extent and we should try to give the patients a supply of all the vitamins. It is a known fact that vitamin B is hardly assimilated orally in diarrhoeic and some cases of dyspeptic patients, and in these cases parenteral administration of vibex and Betaxin should be resorted to—1 c.c. subcutaneous or I. M. every day for 6 or 12 doses, according to the severity of cases does a lot of good.

IV. **Support of circulatory system.**—Mortality of epidemic dropsy cases and all grave troubles of these cases are due to

cardiac inefficiency. Hence "Rest" is the paramount feature among all cardiac tonics. Next comes the food of heart muscle —calcium, iron, glucose and hæmatonics and vitamins. In bad cases calcium gluconate 10%, injections 6 or 12, work miraculously. Of course col. calcium with ostelin vitamin D also works well; oral calcium preparations and calcium rich foods may be prescribed as a routine. Iron and haematonics are useful in anæmic cases. In cases of anæmia with gastro intestinal disturbances, oral therapy of iron and hæmoglobin, liver, stomach extract does more harm than good. Compolon 2 c.c. or 5 c.c. dose, parenterally administered, should be resorted to in these cases. It is also a source of vitamin B. Glucose, orally and Injections of glucose in severe cases of cardiac failure act well. Next comes the question of digitalis group of drugs. What this group of drugs does is not by actually acting on the vagal ending or myocardium but by helping diuresis and preventing the water logging of the heart and the system. The actual rate of heart does not fall so quickly as in auricular fibrillation nor does œdema vanish with preparation of digitalis alone. "Follinerin"—a preparation of oleandar is more active in lowering the rate of pulse. Strophanthin,intravenous, is desirable in extreme cases for increasing Blood Pressure and throwing sudden extra load on heart. Arjun Extract—the stronghold of Ayurvedic medicine can't effect any benefit. Cactine and Euphyllin are cardiac-diuretics and there is nothing much to be hoped for by their use. Of course Euphyllin, orally and parenterally increases diuresis and helps the patient out of extreme orthopnœa. Strychnine is advocated by some and it tones and braces the nervous system in hypotonic and asthenic cases. Adrenalin is said to remove œdema and orthopnœa. Pituitrin should not be tried except in cases of cardiac failure with persistent tympanites. Cardiozol, coramine and allied camphor preparations and caffeine help the heart. Ephedrine group drugs especially Epheche is now most advocated for relieving œdema and orthopnœa. But we should judge cases by their own merit. For, we have seen cases with hypotonia and hypertonia. Of course generally cases with mild attacks have normal blood pressure. Epheche is a bad choice in cases with high pulse rate and extremely high blood pressure. Of course trinitrin—amyl nitrite are dangerous in these places. In two very resistant cases with extreme blood pressure, œdema and angina-like pain with grave symptom of cardiac failure, lacarnol I. M.—6 doses everyday have saved them. Of course Euphyllin could not work satisfactorily, atropine cannot help, where there is œdema

of lungs. Venesection leeches on heart and liver, may be tried in grave cases, to relieve the load from the heart.

V. **Symptomatic treatment**:—*For anæmia*:—Iron orally, Vitamin B orally or by injection. Campolon by injection. Preparation of hæmoglobin, and stomach.

For Pigmentation:—Suprarenal cortex and general treatment.

For Glaucoma:—General treatment of glaucoma, purgatives and diuretics. Operation should be done when medicines have been tried for a week or so and symptoms still linger.

For sores on tongue, gums:—(1) Ingestion of Vitamin 'C' or injection of Canton; (2) Electargol; (3) Oral toileting.

For Distressing Cough:—Cardiac tonics, diuretics and purgatives.

For Cadiac Pain, Orthopnœa and Tachycardia:—Rest, Euphyllin, Ephedrine, Cardiazol, Diuretics, Purgetives, Vitamin B, glucose, Calcium.

For Anorexia:—Dil. HCl tonics with acid and pepsin.

For Hyperacidity:—Neutrolon with or without Belladonna, Megal with Taka diastase, Lactopeptone to help digestion.

For Diarrhœa:—Orphol, salol, Mist pepsinco Bismutho without opium. In some extreme cases of mucous diarrhœa, Intestinal phage works like a charm.

For Constipation:—Saline purgatives are the best.

For Bleeding from piles, uterus, nose etc.:—Calcium and canton or vitamin 'C'.

For Low Fever:—Where there is no other complication as malaria etc. or Bronchitis—Omnadin, Electargol and calcium parenterally have been found useful.

For Amenorrhœa:—Progynon B and Vitamin B injections are most useful.

For Asthenia:—Preparations such as metatone, digestive glycerophosphates are very useful.

Eye Diseases and the General Practitioner

BY

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THIS article contains nothing new from the point of view of the specialist but is an endeavour to help the general practitioner in classifying and treating the diseases of the eye that come under his observation.

I shall not refer to surgical conditions here.

Lids.—Beginning with the lids the conditions that may be met with are :

BLEPHARITIS.—This is a chronic inflammation of the margins of the lids. This may be either of the squamous or ulcerative variety.

Treatment.—(1) Improving the general health ; (2) Medicinal: Removing the crusts after soaking in a sol. of soda bicarb and applying Ichthyol oint, (2-5%) or Salicylic acid, resorcin or yellow oint. (all 1-2 %). Strong irritating ointments should not be used.

The presence of lice in the eyelashes (Phthiriasis Palpebrum) simulates blepharitis and practitioners should be careful to examine the roots of the lashes with a strong magnifying glass for this condition.

HORDEOLUM (STYE) are small swellings with suppurating points at the margin of the lids.

Treatment.—Warm compresses or incision (a horizontal cut) and attention to general health.

CHALAZION (MEIBOMIAN CYST).—These are small hard swellings in the substance of the lids. On everting the lids small grey spots could be seen where these swellings exist in the tarsal plates.

Treatment.— (1) If small, leave alone with only warm compresses and yellow ointment (1 %). (2) If large, evert the lid, make a crucial incision over the grey spot and scoop out the contents.

Note :—All the above three conditions could be due to errors of refraction. Therefore in all cases which resist

treatment or which recur, the sight must be tested carefully for any errors and such cases are suitable to be referred to the specialist.

Before leaving the subject of lids, it should be pointed out that swelling of the eye lids are also met with in diseases which have their origin in the interior of the eye. So in all cases where the lids are swollen especially œdema of the upper lid, but where there are no obvious lesion in the lids, the practitioner must suspect some internal inflammation *i. e.* cyclitis especially if the sight is interfered with, there are alterations in the pupils and pain in the eyeball.

We now come to the diseases of the eye itself. The most usual condition in which the eye case is met with is the presence of the inflamed eye. The white of the eyeball is congested and looks red. The practitioner must be able to distinguish between the different causes of this condition.

Acute Conjunctivitis.—The most common cause is an acute inflammation of the conjunctiva. Here there is usually a discharge, slight or copious according to the nature of the organism causing the disease, the most copious discharge being met with in gonorrhœal conjunctivitis. This latter condition, specially in children (Ophthalmia Neonatorum) is very serious and liable to damage the eye unless early and efficient treatment is given.

Treatment.—(1) Drops of solution of silver nitrate gr. 3 to oz. 1. In severe cases the lids may be everted and swabbed with a solution of silver nitrate gr. 10 to oz. 1. Many practitioners prescribe Argyrol. This is a poor antiseptic and is practically useless in these cases. I have given up using Argyrol in eye cases and use instead Arg. nitras gr. 3 to oz. 1 in all cases where argyrol used to be prescribed before. Silver nitrate should be dropped by the practitioner himself and not given to be taken home by the patient. This latter course leads the patient to make indiscriminate use of it and results in dark pigmentation of the conjunctiva (Argyrosis). For the same reason, whenever these drops are used,the eyes should be washed with a solution of sod. chloride immediately afterwards.

In all cases of acute conjunctivitis with copious discharge, the eyes should be washed frequently with a solution of Hyd. Perch. 1 in 10,000 or boric lotion. One must ensure that the lids are not pressed together due to spasm or swelling of the lids. In these cases, which is very common in Gonorrhœal infection,

the distharge is pent up and is likely to damage the cornea and give rise to serious consequences, even loss of vision. In such cases the practitioner should not hesitate to slit open the lids at the outer canthus. This will relieve the spasm, relax the lids and promote discharge. Such wounds heal afterwards without much visible scar.

Complications.—The most feared complication in cases of acute conjunctivitis is injury to the corneal surface which may quickly lead to ulceration and perforation. If any ulcers developed they should be treated as mentioned under "Corneal Ulcers" below. Other forms of Conjunctivitis are :

1. *Phlyctenular Conjunctivitis* in which there are whitish or greyish spots in the conjunctiva around which the congested blood vessels could be seen. This variety is common in children.

Treatment.—1. Yellow oxide oint. 1% or fine powdered Calomel dusted into the eye. 2. General treatment:—This is most important and includes fresh air, sunlight, good food, tonics, codliver oil etc. In these and other diseases when calomel or yellow oxide of mercury oint. is used in the eye, the internal administration of Iodine preparations, as Pot. Iodide, should be avoided as the corrosive mercuric iodide is then formed in the eye with the iodine thrown out in the tears.

2. *Conjunctivitis with formation of follicles or granulations*, These are :

(1) Follicular Conjunctivitis :—In these cases there are small round bodies raised above the surface of the conjunctiva. This disease is to be distinguished from the more serious Trachoma by the fact that the follicles are usually confined to the lower fornix and lid, the cornea is not usually involved and the disease chiefly affects children and young adults.

Treatment.—(1) Sol. Zinc sulph. gr. 2 to oz. 1 and yellow-oint 1%. (2) General treatment:—Codliver oil, vitamins, attention to enlarged tonsils or adenoids or nasal growths which often co-exist in these cases.

(2) Trachoma:—This is an affection in which there is a granular appearance of the conjunctiva especially of the upper fornix and lid. This disease is highly contagious, corneal complications are frequent and disfiguring cicatrisation is very common. In these respects it differs from Follicular conjunctivitis described above. For these reasons the treatment given to the disease must be started early and must be efficient and prolonged.

Many cases of Follicular conjunctivitis are treated as Trachoma but proper diagnosis is essential as the treatment for the one is quite unsuitable for the other. The early detection of Trachoma and its efficient treatment is really the job of the trained specialist but the General Practitioner can carry on, when he has no other help, with certain treatment of the condition which will save the spread of the disease, prevent complications and very often cure the disease.

Treatment.—When there is any discharge in the affected eyes, drops of silver nitrate gr. 3 to oz. 1 is used together with yellow oint. 1% which is then massaged into the eye. When the discharge has stopped, the everted lid, after being cocainised, is swabbed with a solution of either Copper sulphate (10%), perch. of mercury (1%) or silver nitrate (2%). None of them should be used for more than a fortnight at a time but they may be used alternately. Copper sulphate sticks were used formerly to rub the trachomatous lids with but this practice is now considered too severe and has been given up in most eye hospitals. One contra-indication for the use of copper sulphate is the presence of corneal ulcers: hence before using this drug one must be certain that the cornea is not involved. Otherwise severe corneal injury will result.

Corneal Ulcers.—In all the conditions described above, the cornea is clear and transparent. But when there are greyish spots or areas in the cornea ulcers must be suspected. When the ulcers are healed the resulting scar is smooth and whitish in appearance. To find out if the areas in the cornea are active or healed ulcers, they must be stained with Fluorescine solution (made up of Fluorescine gr. 10, Borax gr. 10 aqua dist oz. 1). A drop of this is instilled into the eye and the excess of the solution wiped off when the ulcer will be stained a green colour. Healed ulcer does not take the stain. Corneal ulcers may be caused by foreign bodies, in growing eyelashes (Trichiasis) or by growths in the lid margin. They may also be secondary to Acute Conjunctivitis or Trachoma. Corneal ulcers should, therefore, be treated energetically and carefully lest they invade the deeper layers and cause perforation. Moreover, the deeper the ulcer the denser the scar that is left after healing and hence greater the defect in the vision.

Treatment.—(1) Removal of the cause of the ulcer (2) Treating the primary disease when the ulcer is secondary to it. The

chief of such primary diseases are Acute Conj. and Trachoma. In these cases Argent. Nitras (gr. 3 to oz. 1) drops are useful, especially where there is a discharge. Thereafter, yellow oint. or noviform oint. may be used. For pain, atropine is useful and this should be used in all but slight cases as, besides relieving pain, it relieves also the accompanying iritis. Instillation of cocaine to relieve pain is not recommended as this damages the corneal epithelium and makes the ulcer worse. Where necessary one of the cocaine substitutes, Novocaine, Pantocaine etc., may be used. Dionine, gr. 24 to oz. 1 is useful in later stages. A pad and bandage should be used after treatment as this relieves pain and adds to the comfort of the patient.

A word about the use of bandages in eye diseases will not be out of place here. Very often an eye is bandaged where it should not be and another is not bandaged where it should be. As a rule, bandage must be applied in all cases where the cornea is damaged either by ulcers, foreign bodies (which must be removed before bandaging) or injury. But even in these, a copious discharge from the eye is a contra-indication. On no account must bandages be applied over acutely inflamed eyes which are discharging profusely. When only protection from light is needed, eye shade and not bandage must be applied.

It is also necessary to say a word about the use of atropine as this is very often used indiscriminately with disastrous results. Atropine is used in all cases of Iritis and in corneal ulcers and injuries where iritis is feared. After the iris is well dilated, it is unnecessary to prolong its use. As a rule, atropine should not be used for patients over 40 for fear of bringing in an attack of glaucoma. It is a good rule to use it only when there is a definite indication for it after making sure that there is no contra-indication.

Fever in Pulmonary Tuberculosis And its Treatment

BY

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FEVER is an expression of the general reaction of the system to tuberculine absorbed from the focus in the lungs. In most cases it is a constant factor and is an infant companion of the disease. The degree of the temperature varies according to the intensity of the toxins absorbed and the patient's power of reaction. It plays a great part in disturbing the mental equilibrium of the patient. In some cases the acuity of mind produced by it well compares with the exhilaration produced after an alcoholic drink; in others the depression brought on by the rise of temperature damps down all his hopes about his recovery. One often hears from the patient that if only he could get rid of his fever and cough, he would be well in no time.

Though temperature above the normal is a proof of the activity of the disease yet its absence or fall does not always show that the disease has become less active or cured. Most certainly it shows its quiescent nature. In many cases indeed, the ground gained by the patient after the temperature has been controlled and the mental rest attained is so important in effecting a check on disease.

Should pyrexia be reduced only by measures other than medicinal or, is the use of anti-pyretics called for, is sometimes, a matter of opinion. I believe that the anti-pyretics occupy a definite place though drugging should be very much deprecated. Our stock of cases is mostly drawn from people who have been allowed to move about despite high temperature and their fever has become so resistant that no amount of rest would do if not assisted by the use of febrifuges.

Treatment of fever may be considered under the following headings :—

I. Non-Medicinal.
II. Medicinal.
III. Surgical Measures.

I. **Non-Medicinal Measures.– Complete Rest and Fresh Air.**—The importance and indication of complete rest is not

much understood and appreciated by an average case. Some would take confinement to the room as rest and others though sticking to bed would keep sitting and count it as rest. Indeed it is very difficult to define and enforce rest. *Complete rest means lying in bed with all the muscles of the body relaxed and without any mental pre-occupation. Mental relaxation is as essential as physical rest.* Mental and physical relaxation depend on the patient's nature. Highly strung, nervous and anxious type cannot attain as much peaceful attitude as the stolid, happy-go-lucky and resigned type of patients. The capricious rich though ready and able to purchase their cure cannot take as much rest as the middle class and the believing type. Relaxation gives the least stimulus to the tuberculin to leave the focus to circulate in the system and thereby raise the temperature. The effect of cool and fresh air is to soothe the body and mind. It produces a somniferous effect on the excited nerves. Cough is very much lessened by it. Relaxation is thus indirectly brought by the fresh air and hence the fall in temperature.

Application of water or cool-packs on the head and body is not much tolerated by the tuberculous patient.

II. **Medicinal Measures.**—Of the medicinal products the following are very much in-vogue, used according to the likes and dislikes of the treating physician. The guaiacol group has sufficiently been given a trial in this condition. It acts as disinfectant as well. Many cases do react on it very well. But in my experience their use is limited to pre-tuberculous, early or convalescent stages. I often find it of no avail in established fever.

Cryogenine and Pyramidon are two valuable additions to the list. Even in those refractory cases where the temperature does not come down with all other measures at our hands, Cryogenine does wonders, when given in gradually increaseing doses starting from very small ones. As much as 30 grains a day of Cryogenine (10 grs. T. D. S.) have been given by me without any ill-effects. In some cases sweating is produced by it but it seldom happens, if the drug has been pushed up from very small doses i.e., 1/3rd a grain. Another thing that happens when the patient is taking this drug is that a substance very much like turmeric in colour appears in the urine and solidifies in the urine pot and stains it as well. I do not know its exact nature but it appears invariably when Cryogenine is being given though I have found no harmful bye-effects accruing from it. I think it is excreted

almost all of it, by the kidneys, after the Cryogenine has done its work.

Since the last four years, I have been trying a routine treatment and I dare say that this method of administration has proved very efficacious in controlling the temperature. As the temperature in tuberculosis is a continuous one with intermissions if some medicine is given in small but effective doses throughout the 24 hours, the temperature should yield to it and be kept low throughout. With this in view I have been using Novalgin (Bayers) Grains 7½ to 21 (according to the nature of the case and intensity of pyrexia) are mixed up with Calcium Gluconate 2 drachms and dissolved in 10 ounces of water in a tumbler. This mixture in the tumbler is kept on the patient's bedside table with the instructions that it should be sipped every hour and the 10 ounces should be finished in 24 hours. More than 20 percent of the cases are controlled within 10 days to 2 weeks and after continuing the medicine this way for a month or two more, the dose of Novalgin is gradually reduced till the patient can do without it. In the meantime chemotherapy or A. P. has been tried and the disease is controlled.

Chemotherapy.—(Solgonal—B—Oleosum, Oleo Sanocrysin, Myocrysin and Aurothisin).

Gold preparations have formed the basis of this treatment. Febrifuges may suppress the pyrexia for quite a long time but may not cure the disease. The curative effect is brought about by the Aurotherapy in about 60 to 70 per cent of the cases. Oil emulsions of gold have got the advantage in getting gradually absorbed and thus producing a continuous influence on the system. Solgonal—B—Oleosum is the product being used by me extensively during the last few years. Often it happens that after the full course of Solgonal—B—Oleum, the disease has not fully subsided and a slight temperature and crepitations persist and in such cases a change to another preparation or to an aqueous solution of gold brings about the desired effect.

There are cases where gold cannot be given e.g., where intestines and kidneys are also implicated. I have found that sometimes Calcium Gluconate 10% 10 c.c. given intravenously does a very useful basement work. When the diarrhoea has ceased a gold preparation may be cautiously and gradually started. Calcium though of definite value seldom does the curative

work by itself, whereas Collosol Iodine (Crookes) given intravenously in. 2% 10 c.c. dose every day or every other day does very much good in those who have not exhibited hæmoptysis during the course of disease. I have records of many cases where Collosol Iodine (Crookes) was the only product used and which cured them. On the basis of such cases I hold that it is the efficiency of Iodine which is responsible for the cure. The effects manifest are so quick that one has got to think this way.

III. **Surgical Measures.**—Artificial pneumothorax and phrenic avulsion are the only two measures being used by me. They act by bringing rest directly to the affected part. Temperature in my experience in A. P. begins to come down after the fifth or sixth refill, in very straight-forward cases. Where contralateral lung is also unhealthy, Aurotherapy has to be combined with A.P. Usually as a routine, I put the case on Novalgin, Calcium Gluconate in the way described above, then induce A. P. If after 5 or 6 A.P.s, the temperature is well under control, I gradually wean the patient off Novalgin till it is stopped. *I personally believe that A.P. treatment is incomplete without Aurotherapy.*

Summary.—1. To control the pyrexia of tuberculous patients, one or all of these measures have to be combined. It is the team work which gives the best result. Medicine alone often fails us. The scope of surgical measures is quite limited. Hæmoptysis, Intestinal and Kidney complications are impediments in the way of Aurotherapy but are not absolute contra-indications.

2. Novalgin and Calcium Gluconate used in the way already described have proved very efficacious in my hands.

3. Calcium Gluconate is a very useful adjunct in the case complicated by Hæmoptysis and Diarrhoea.

4. Collosol Iodine Solution (Crookes) given intravenously has as much credit as the Aurotherapy and requires a wide trial. Often times I mix 10 c.c. of 2% Collosol Iodine with 10 c.c. of 10% Calcium Gluconate and give intravenously with very good results.

Treatment of Granular Lids (Trachoma)*

BY

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THE subject of this paper has been selected for two reasons, namely, due to the frequency of the disease among the masses and comparatively the most simple treatment that can be followed by a general practitioner.

Treatment of Trachoma can be divided into the following :–

I. General considerations.
II. Treatment of the conjunctiva.
III. Treatment of the complications.
IV. Treatment of the sequelae.

I. **General Considerations.**—In considering the general aspect of treatment, Trachoma is as much curable as Pulmonary Tuberculosis. But there is a chance of cure if the disease is seen early and proper steps are taken.

Prophylaxis:—It is very important. The medical man or the attendant should always wear protective goggles whenever he is engaged in the treatment of trachoma. If accidentally the discharge enters the eye of the attendant, the conjunctival sac should be thoroughly washed immediately. This is followed by touching the everted lids both upper and lower, with Ag. No. 3, 2% and washed with saline lotion.

General Treatment:—In schools, jails, etc., where Trachoma patients predominate, the infected people should be immediately separated from the rest and treated.

It is considered by Trachomatologists that Trachoma is a local infection confined to the eye lids and cornea. But the general health of the patient should also be looked into if one wants to successfully cure a case of Trachoma. If the general health is below par it should be improved by giving tonic internally ; if there is a septic tooth or septic tonsil it should be removed ; Malaria and Ankylostomiasis should be cured, if present.

Dr. Stahotsky, in his experiments on Trachoma, believes that Trachoma is not at all a local disease but it is a disease of the whole organism. He left the local treatment altogether and

* Read at the meeting of the All-India Ophthalmological Society held at Bombay.

treated exclusively through parenteral route. He selected for this purpose, "Yatren 105", because of its germicidal property and of its pronounced non-specific stimulating action on the system. He used 3 to 5 c.c. of 4% solution subcutaneously every week for about 6 times in simple as well as in complicated cases. In severe cases he injected 5% "Yatren" Casein with successful results.

Basing on the same theory, some Trachomatologists treated the disease by active immunization through subcutaneous injections of patient's own blood.

I have been following Dr. Stahotsky by injecting, on simple as well as complicated cases of Trachoma, "Yatren" 105, 4% solution which was kindly supplied by Havero Trading Co., Bombay. As I have only started them recently, I cannot give any definite idea of the drug but I hope to give some definite data, when we meet next year. The results seem to be encouraging.

The local treatment of Trachoma takes a very long time varying from months to years. Greatest patience should be exhibited both by the ophthalmologist as well as by the patient in successfully eradicating the disease.

II. **Treatment of the Conjunctiva.**—The treatment of the conjunctiva was grouped under 4 headings as treatment of stage I; II-A; II-B; II B^1 : II-C; III; IV.—Classification by Dr. A. F. MacCallan.

The various drugs used for different stages of the diseases are the following :—

(1) Silver Nitrate—2% aqueous solution.

(2) Perchloride of Mercury 1% or cyanide of Mercury 1%.

(3) Copper sulphate crystals or 10% aqueous solution or Copper citrate ointment.

(4) Chaulmoogra oil.

(5) Other than drugs which are unimportant.—(*a*) Phototherapy by the Finsen lamp. (*b*) Treatment with X-rays. (*c*) Treatment with radium and carbon dioxide. (*d*) High frequency currents or surgical diathermy.

Out of these the first three are advocated very freely and the 4th less frequently for treating the disease.

Treatment of Stage I.—This stage is manifested by the sub-epithelial lymphocytic infiltration which is characterised by

the presence of follicles on the fornix conjunctiva. This stage may not be seen by the ophthalmologists as very few people approach them in the early stages.

Mild astringent drops such as zinc sulphate $\frac{1}{4}$ to $\frac{1}{2}$% are indicated.

If there is any conjunctival discharge 2% Silver Nitrate is used. This should be touched over the everted lid and washed with saline or Boric lotion for above 15 days or for some weeks. At bed time, a mild salve like vaseline or Ung-Boric should be applied to the lids to prevent sticking.

Sub-conjunctival saline about 1·5 to 2 c.c. to start with and gradually increased, may be of use in this stage. The normal saline assists the absorbtion of the sub-epithelial infiltration. Cyanide of Mercury along with Novacine and Adrenalin 1 in 1000 in small doses may be injected under the conjunctiva but there will be great œdema and pain. There may be complete cure after a course of treatment for 3 months.

Treatment of Stage II-A.—This stage is characterised by the presence of large bleb-like excrescences which rupture on pressure. This stage is generally seen by the Ophthalmologist.

The treatment of this stage consists in expressing the contents of the blebs by mechanical means such as Knapp's Roller Forceps, Graddy's forceps etc. Previous to expression the eye is anæsthetised with 4 % cocaine or 1 % pantocaine. (Bayer's) with adrenalin. The mechanical treatment should be carried out gently without causing much injury to this conjunctiva. This may be repeated as often as necessary. Immediately after the expression the eye is bandaged for about 1 or 2 hours to control hæmorrhage. On the next day the conjunctiva of the everted lids should be touched with cyanide of mercury or perchloride of Mercury 1% and this is continued for not less than a month. The patient during the course of treatment may be advised to use mild astringent drops such as zinc sulph. $\frac{1}{4}$% in the evenings.

Treatment of Stage II-B.:—The subepithelial layer of the conjunctiva is heavily infiltrated with inflammatory exudate throwing the surface into papilla.

In this case the mechanical treatment should be followed by touching with cyanide of Mercury 1 %. This may be continued till the cicatricial process starts in the conjunctiva.

In cases where mechanical expression is contra-indicated, copper sulphate crystal or 10 % solution of it or cyanide of

Mercury 1 % may be used daily till the cicatricial process starts in the conjunctiva.

Treatment of Stage II-B[1] :—This is characterised by combination with Trachoma and spring catarrh. Silver Nitrate 2 % is used. Excision of the fornix or combined with tarsus may be advocated. But in spite of it relapses are common.

During the course of the treatments II-A, B', B", C, the conjunctiva is bathed daily with 1 in 5,000 perchloride of Mercury lotion once or twice. A mild salve should be applied to the lids at bed time.

The whole treatment of the 2nd stage is to lead to the 3rd stage *i. e.*, aiming for cicatrization of the conjunctiva.

Treatment of Stage III :—This stage is characterised by the formation of a net work of fine lines of connective tissue around the Trachomatous follicles. In this stage degenerative changes are also seen on the palpebral conjunctiva.

Copper sulphate is the best to be used in this stage. The crystal should be touched over the everted conjunctiva of the lids and the excess is washed out with saline or mopped out. 10 % solution of copper sulphate is also used. Dr. MacCallan uses the solution instead of the crystal. But personally I use the crystal with equally better results. The use of copper sulphate is contra-indicated when there is corneal ulceration. This treatment is carried out daily for about 15 days. Then 1 % perchloride of Mercury should be continued for anothar 15 days instead of copper. After that a week's rest is advised. Then it is followed by Copper sulphate, and 1% perchloride of Mercury each for 15 days followed by rest and so on, till there is perfect cure.

In this stage the sub-conjunctival saline or cyanide of Mercury may be tried with benefit.

If there is cicatrization of the fornix with incurving of the tarsus combined excision of tarsus and conjunctiva is advised.

For the pannus, which is a common complication at this stage, nothing need be done except continuing the above treatment. The use of copper is highly advised. Peritomy, recommended by various authors, is in my opinion not necessary.

Treatment of Stage IV :—This stage is characterised by the absorption of Trachoma follicles and the subepithelial Trachomatous infiltrations and replaced in its place by cicatricial tissue. Between these cicatricial areas there are areas of healthy conjunctiva.

In this stage practically no treatment is necessary but to prevent fresh attacks on the healthy conjunctiva, zinc sulphate or chloride drops $\frac{1}{4}$ to $\frac{1}{2}$% and copper citrate ointment 5% are advised.

I have tried chaulmoogra oil for touching in the III and IV stages to help forming uniform cicatrix with better results. In the Government Ophthalmic Hospital, Madras, Chaulmoogra oil is extensively used. Chaulmoogra oil ointment is also tried with better results.

Conclusion.—The whole treatment takes a very long time. If the case is taken up early, results will be favourable. In some cases, in spite of the treatment, the III stage never gets better.

To sum up the treatment as a whole, silver nitrate 2% should be started when there is discharge. After the discharge stops the conditions of the conjunctiva should be looked into. If there are bleb-like elevations due to the inflammatory exudate and trachoma follicles, they should be expressed by mechanical means such as Knapp's Roller Forceps, or Graddy's etc. This may be repeated several times at sufficient intervals. The conjunctiva should be touched with cyanide of Mercury or perchloride of Mercury 1% during the intervals.

When the follicles begin to disappear, and surrounded by fine lines of connective tissue, copper sulphate should be started This should be continued for a period of 15 days followed by a course of 1% solution of perchloride of Mercury, a week's rest and again copper sulphate, perchloride of Mercury, rest and so on. In this stage, sub-conjunctival saline or cyanide of Mercury may be advised for absorption of the inflammatory products. Combined excision of the tarsus and the conjunctiva may be undertaken when there is marked curving of the tarsus.

When the inflammatory areas are replaced completely by scar tissue, zinc chloride drops and copper citrate ointment are given for some time to prevent fresh attacks.

III. **Treatment of Complications.**—The most frequent complications are :—

(1) Corneal ulcer, (2) Pannus and (3) Bacterial conjunctivitis.

1. *Corneal Ulcer* :—The usual treatment of a corneal ulcer is advocated. Touching the conjunctiva with silver nitrate 2 % should be continued. Care should be taken to see that the swab does not touch the cornea. After touching, there should

be a thorough wash with saline or Boric lotion. Government Ophthalmic Hospital, Madras, advocates concentrated Mag-sulphate baths. Cyanide of Mercury bath 1 in 20,000 is also advised. The eye should not be bandaged when there is profuse discharge. Bandaging is absolutely necessary when there is threatened perforation with scanty conjunctival discharge.

Boric fomentations at frequent intervals are advised.

Atropine drops 1 % should be dropped twice, thrice or even 4 times depending upon the ulcer. If there is atropine idiosyncrasy it should be immediately stopped. I have seen patients developing œdema of the lids, watering of the eye and sometimes signs of atropine poisoning. Therefore, atrophine should be carefully used in case of a corneal ulcer.

In case the ulcer spreads, the spreading margin should be cauterized best with a galvanic cautery. The eye is previously cocainized and the tip of cautery is brought to the spreading margin of the ulcer and cauterization is done. Cauterization with Tr. Iodine or Carbolic Acid swab is also practised.

If the ulcer persists I have used several times in my practice optochin hydrochloride ointment 1% with best results. This is found to be specially useful when the ulcer is due to pneumococcal infection.

Hypopyon (pus in the anterior chamber) may also be present in some cases of corneal ulceration. In these cases the usual therapy of a corneal ulcer should be continued. The pus should be allowed to absorb. But in cases where there is abundant pus, Milk injections started from 5 c.c. and increased up to 10 c.c. for 2 or 3 times, are found to be very useful. I have seen cases, in which the pus disappeared on the next day after an injection of sterile milk. This is a simple process. Fresh cow's milk is boiled in a test tube, cream is separated and the measured quantity of milk after cooling is injected intramuscularly. This may be repeated at an interval of 2 or 3 days.

If the ulcers are sloughy with stringy exudation in the anterior chamber, the division of the base of the ulcer with a narrow cataract knife from within outwards is best (Saemisch's section). It allows revitalization of the edge of the ulcer by prolapse of the edge of the iris. After heal of the ulcer an iridectomy is necessary. I have tried this in one case but I was not successful due to the severe type of the infection.

In some cases the ulcer perforates. The pupil immediately contracts and the iris gets incarcerated in the wound. Then atropine should be stopped. The adherent iris will vascularize

the edges of the ulcer and lead to repair, with the formation of an adherent leucoma. As soon as the inflammation subsides, an iridectomy should be performed to prevent the onset of glaucoma and restore sight. The use of copper either in the form of sulphate crystals or 10% solution or in the form of Copper Citrate ointment is highly contra-indicated when there is corneal ulceration.

2. *Pannus*:—It is one of the common complications of Trachoma.

There is no specific treatment for pannus. The usual treatment should be continued. The use of copper in these cases is highly praised. Copper sulphate crystals should be used for touching over the everted lids with best results. Rubbing should not be light. In about 1 or 2 months there is a distinct improvement. Copper citrate ointment 5 to 10 % is also advocated with equally good results.

Peritomy is advocated when there is extensive pannus. The object of peritomy is to cut off the blood supply to the overgrown tissue lying over the cornea. This is done by making a semi-circular incision immediately above the upper margin of the limbus. The incision should cut off all the blood vessels that run from above downwards, and should reach the sclera. The wound is immediately cauterized to ensure better results. After the healing of the wound, Copper should again be used for some time. Plasma ointment should be applied to the eyes and massaged once or twice daily for rapid absorption of the vascular tissue. With the same object in view saline injections sub-conjunctivally may also be given with successful results.

The difficulty comes about the advocacy of copper sulphate in cases of pannus associated with corneal ulcer. In these cases the ulcer should be allowed to heal at first by the use of silver nitrate solution, Atropine drops, Boric fomentations, Mag-sulphate or perchloride of Mercury baths etc. After the healing of the ulcer, copper should be started and continued till the pannus disappears.

3. *Acute Bacterial Conjunctivitis*:—This is also one of the common complications of trachoma. The Koch-Weeks bacillus, the gonococcus, strepto-staphylo coccus, the pneumo-coccus or the bacillus diphtheria are the common organisms.

Microscopical examinations of the stained films should be seen and the conjunctivitis is diagnosed. Cultures should also be made if necessary.

Silver Nitrate should be used in almost all the cases. Perchloride of Mercury 1 in 5000 or eusol solution 1 in 10 should be irrigated frequently. Sometimes even continuous irrigations are also necessary in severe types of cases.

Anti-Diphtheritic serum should be given in large doses when there is diphtheritic conjunctivitis; Anti-Pneumococcal serum should be given when there are pneumococci in the discharge and when there are hypopyon and sloughed ulcers. Gonococcus vaccine is given when there are gonococci and strepto or staphylococci vaccine is given when there are strepto and staphylo cocci in the discharge.

Drops like Mercurochrome, Argyrol, Protargal may also be dropped during the course of treatment. Optochin ointment is used when there is pneumococcal infection. A mild salve like vaseline or Boric ointment is used at bed time to prevent sticking of the lids.

IV. **Treatment of the Common Sequelae.**—1. Entropion and Trichiasis. 2. Ectropion. 3. Symblepharon. 4. Leucoma.

1. *Entropion and Trichiasis*:—This is the most common sequelae of trachoma due to the incurving of the tarsus.

For Trichiasis, Epilation is done for 2 or 3 in number but unfortunately double or even treble the number arise and cause worst results. It is condemned now-a-days in view of the successful operative methods.

Electrolysis in 30 seconds may be carrieds out if there are not more than 3 lashes but unfortunately the results are not quite successful. I confess that I have no experience with Electrolysis.

Operative methods for Trichiasis and Entropion:—There are three important operations and they are :—(1) Webster's operation (Mucous Membrane graft operation), (2) Streatfield's Snellen operation. (Removal of a wedge-shaped piece of the tarsus.) (3) Combined excision of the Tarsus and the conjunctiva.

Out of all these, Webster's operation is considered to be the best and is applicable to the early as well as advanced cases of Trachoma. The operation consists in inserting a graft of mucous membrane of the lip suitably trimmed into a groove made with the point of a knife along the whole free border of the lid immediately posterior to the lashes.

The Streatfield Snellen operation consists in excising a wedge-shaped strip from the anterior surface of the tarsal plate, the

base of the wedge being anterior and bringing the cut surfaces of the tarsus by means of sutures.

The combined excision operation is advocated in old cases of Trachoma with Entropion and in Trachomatous ptosis.

The operation consists in excision of the whole tarsal plate except a narrow strip along the margin of the lid with the conjunctiva adherent to it.

In all these operations, I have used pantocaine ½% Bayer's with adnenalin 1 in 1000 for local infiltration anæsthesia with best results. In neurotics and children general anaesthesia is advocated.

2. *Ectropion*:—(Eversion of the lid) is more common in the lower lid. V Y operation is advocated by very many surgeons. The operation consists in giving a V shaped incision below the lower lid with the apex V pointing downwards. The margins of the incision are undermined and sutured in such a fashion that a 'Y' shaped cicatrix is the outcome.

3. *Symblepharon*:—Operative procedure is the only resort. The adherent growth is separated from the cornea carefully and is excised from its conjunctival attachment. A mucous graft is placed between them and allowed to heal.

Opacities of the Cornea:—They are very common due to neglect of proper treatment during the course of corneal ulceration.

Fresh and light opacities dissolve by dionine and plasma ointment of different strengths. Injections of normal saline or aqueous solution of Sodium Iodide 2% are given under the conjunctiva with successful results. But old standing cases do not respond to the above drugs.

In thick opacities, optical Iridectomy is done where the cornea at that area is clear. There should be good perception and projection of light for doing an iridectomy. Suitable glasses are also prescribed for wearing after the operation for improvement in sight.

Tattooing is done in some corneal opacities for cosmotic purposes and for improving the sight. This is done with Indian ink or gold-chloride. The area of the scar is scraped with the blade of the knife and sterile Indian Ink is applied over it. Gold Chloride may also be used instead of Indian ink. Tattooing has to be repeated, if necessary.

Tattooing is also done with tattooing needles.

The eye should be previously cocainised before tattooing. All aseptic precautions should be undertaken during the course of the operation. After the operation, the eye is bandaged and dressed for 7 days like other aseptic eye operations. Atropine 1% either in the form of drops or in ointment form should be freely used.

For thick opacities which cover the whole of the cornea, where there is no possibility of absorption of the opacity or doing an iridectomy for improvement of sight, keratoplasty is advocated.

The operation consists in replacing the opaque cornea by a healthy transparent cornea. For a healthy, transparent cornea, a donor is necessary which is very difficult in the ordinary circumstances. It was found out by the experience of various surgeons of international repute, that corneas other than human are not well suited for keratoplasty.

Diagnosis of Schuller-Christian's Disease.

Schuller cites three cases which demonstrate that x-ray examination of the skull in cases of Schuller-Christian's disease can show hyperostotic osseous changes. This symptom, which corresponds to the healing stage of the xanthomatous process in the bone, might be of some value for the diagnosis. The symptoms, as a rule, begin in the skeleton, especially in the skull. Roentgenograms of the skull taken at this time show multiple defects at the vault and at the base of the skull, the orbital walls or the lower jaw. The x-ray examination must include all other bones, especially the pelvis and ribs. A roentgenogram of the lungs may show a diffuse infiltration with miliary nodules. Important anomalies are seen on the skin in many cases; xanthelasma of the eyelids, xanthomatous or seborrheic efflorescences of the skin may be found. Finally, the excellent therapeutic effect of x-rays on the xanthomatous process may help in the diagnosis. Mistakes in the diagnosis of Schuller-Christian's disease are not uncommon, especially in the early stages of the disease. The multiple defects of the skeleton may be mistaken for syphilis, tuberculosis, malignant disease myeloma, osteitis fibrosa cystica or suppurative osteomyelitis. A wrong diagnosis of xanthomatosis may be made in cases of meningocele spuria traumatica. The large transparencies of the calvarium seen in cases first described as "circumscribed osteoporosis of skull" (corresponding as a rule to incipient Paget's disease) can also be mistaken for xanthomatosis.—*The Journal of the American Medical Association.*

The Hypo-Tension Syndrome

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Major M. G. Naidu drew our attention to several cases of young vegetarians (all of them young Brahmins of 18—25 years of age) with very tortuous, prominent and hard radial arteries. There were hypertension and arterio-sclerotic changes of the lumen present to a high degree. They were lean, nervous, hyper-æsthetic; sometimes they showed hyper-thyreotic symptoms, gastric derangement, vegetative disturbances, and could be classified under the Habitus Aesthenicus (B. Stiller) grouping. On the other hand, we were surprised to find a large number of patients of the opposite type; they were of the gigantic, athletic and apparently florid venous type with the soft pulse-beat of babies. They exhibited a variety of subjective symptoms which, we later on, learnt to connect with lowered blood pressure. Much, perhaps too much, has been written about Hypertension. Rightly, or perhaps more wrongly, Hypertension has become the bug-bear of the average physicians and patients who regard it as the prelude to Hemiplegia. On Hypotension as a distinct clinical and pathological picture the literature has been scanty. All the same, if one should rightly consider the main symptom-complexes arising out of Hypotonia, and the fact that they are more prevalent than they are being diagnosed at present, we believe that they should be more closely studied in the future because a large variety of vague and inexplicable, but absolutely undeniable, subjective and objective symptoms which generally defy ætiological classification, are, if carefully followed, traceable directly or indirectly to Hypotension. Martini and Pierach drew pointed attention to this phenomenon and believed that especially the gynæcologists, neurologists and oto-rhinologists should have studied and should study this aspect closer because many unnecessary and avoidable operations as wellas expensive and protracted methods of treatment could have been avoided in the past and can be avoided in the future.

The fact is that whereas Hypertension can result from or in histologically demonstrable organic changes, Hypotension is in

its quintessence an organismic or constitutionally conditioned derangement of the vegetative nervous system demonstrable only as a symptom complex or complexes of pathological functional changes. It is functional pathology or constitutional pathology of the Vegetative Nervous System. Hypertension is found in a variety of pathological conditions, but the cardinal fact is that all its ætiological factors have something in common. In Hypotension unfortunately there are no demonstrable ones, or at most a very few. We find Hypotension temporarily in all acute and permanently in certain chronic diseases. It is pathognomonic for Tuberculosis. It is an expression of an inferiority of muscular energy sources brought about either independently through sarcoplasmal structural changes under endocrine disturbances or primarily through nervous influences. It may affect the entire circulatory system or only a part of it.

One point must be emphasised. Hypertonia and Hypotonia can both exist and be compatible with normal life as long as no functional unbalance is determinable. Both phases are under certain conditions, normal expressions of individual constitutions. They become pathological as soon as functional disturbances appear. V. Bergmann, Thannhauser and Gruber have shown that functional disturbances appear long before histologically determinable organic changes are manifest. Under these circumstances, it is difficult, if not inadvisable, to try and fix a definite manometer level as being "normal" or "abnormal", especially with regard to Hypotension. B. P. readings have been taken in various countries to fix a normal. In India, studies of metabolic rates have been made by Muckerjee and Gupta in Bengal, Stock and Carns in London on Indians, Subba Reddy at Vizagapatam and Rahman at Hyderabad (Deccan), and incidentally B. P. readings have been taken. The average figures were 108/78 Bengal, 114/74 Punjab, 118/80·3 (Stock and Carns), 116·8/76·9 Vizagapatam, and 100·4/71·8 (Rahman) for Hyderabad Deccan. The only criticism we have to offer is that we find ourselves unable to accept any of these averages as "normal" or the subjects that underwent these tests as "absolutely healthy and normal", just because they showed no gross organic lesions (apparently quite healthy and active")–Rahman p. 177.) "Normality" is strictly individual and the B. P. reading may he anything as long as the particular individual shows no detrimental symptoms. In the Hypotonia syndrome we find no gross anatomical lesion, the hypotonic is never so ill as to be bedridden or requires

hospitalisation. He is a mass of small but poignant vegetative disturbances which cannot be measured by the yardstick, basal metabolic averages or the X-Ray apparatus. He is all the same, clinically, a sick person that needs a definite diagnosis for all his vague symptoms, and while it is true that a low B. P. reading is compatible with symptomless existence, the converse holds good that a certain set of syndromes now to be described, found together with a low blood pressure reading is to be ascribed solely to Hypotension and that these symptoms are improved or abolished by raising the blood pressure level temporarily or permanently. Our averages have worked out to 100±5/68±3 for males and 90±3/62±3 for females. We attach no importance to "averages", and when we find such low levels coupled with these symptoms, we regard them as clinical Hypotension pertaining to that particular case, irrespective of the "normal", "average" and "physiological" findings of others.

Symptomatology.—Almost all the symptoms in the Hypotonia syndromes are commonplace and indeterminate. But connected with a low blood pressure as constant concomitant, they become a composite and colourful picture. The majority of these patients state that they have begun to get easily and abnormally tired both physically and mentally. They complain of indecision, depression, hypochondria, desire for solitude and yet afraid of being alone, feel uncertain and worried in a crowd, palpitation, feeling of oppression, cardiospasms, pain and heaviness in the hypochondrium, loss of appetite, hyperacidity, nocturnal gastralgias, feeling of abdominal tension and uneasiness, eructation, heartburn, sometimes symptoms simulating gastric ulcers; they are finicky about their diet, cannot tolerate fats, raw sugar, raw starch, show various sensitivities amounting to allergies but are really not allergic, often obstinate constipation alternating with diarrhoea, when emotionally excited or disturbed, and even mucous colitis. Especially frequent are headaches, vertigo, nausea, spells of fainting and migraine (we have treated cases of migraine which have perambulated for years from gynæcologists and oto-rhinologists to other specialists who did everything except measure the blood pressure), and especially predominant are the disturbances of the vegetative nervous system,—colds hands and feet, vasomotor cold sweats, alternate flushing hot and cold, nervous diarrhœa and spastic constipation. A very important symptom is the gradual and early loss or dimunition of erectile power,

libido and potency. These patients seem to suffer intensely after every coition, and in women there manifests itself a partial frigidity and aversion to the sex act. Orlowski, drawing pointed attention to the intimate relation between impotency, erectile weakness and hypotonia, and Aschner to the constitutional menstrual disturbances in women, emphasised that in all problems of impotency, the investigation whether hypotonia is present or not, is of paramount importance. Especially intellectual patients who complain of rapid and early physical and mental exhaustion, of a growing inability to concentrate on their work, a growing weakness of memory, occipital headaches, muscular twitchings, insomnia, disturbed sleep, starting, in sleep, vivid and persistent dreams of being followed, persecuted, and attacked by animals (chiefly snakes, tigers, dead bodies, skeletons), fear death, are easily agitated, easily irritated, feel ill after the least disturbance or quarrel, yet must quarrel, are of pronounced psychic lability, and in women we come across a host of well-known hysterical symptoms and menstrual irregularities in all gradations. So commonplace and indeterminate as these findings are, so much the more difficult are they to cure without finding the basic cause. To a good homœopath, all these symptoms are nothing new. He could name a dozen drugs producing these subjective symptoms and would apply these same drugs to suit each individual drug picture e.g., Kali, Carb, Sepia, Lachesis, Platina, Pulsatilla, Cratægus, Ignatia etc. We allopaths, however, still have to search for the cause or causes of Hypotonia even if we do not find the drugs that cure.

Clinical Pathology.—It is difficult to classify Hypotonia. We know too little about its ætiology and pathogenesis. In certain forms, it is a primary disease of muscular tonus, and in other cases the pathological change in tonus sub-stratum is a secondary process. We have a generalised Hypotonia of the circulatory system in 2 forms: *congenital* and *acquired.*

Congenital Hypotonia is a constitutional problem and a permanent problem at that. The entire cardio-vascular system is affected and the picture is completely and unmistakably one of Hypotonia. The outstanding example is the Habitus Aesthenicus (B. Stiller, with the drop-form heart). The arteries are soft, the blood pressure readings fluctuate on the lowest normal scales of the Daumanometer, and more often even lower, the heart is small, the patient generally of the slim lightly built type, the sternal angle acute, the stomach generally vertical and

the diaphragm high—the ideal type for Tuberculosis. This type or any of the equivalent types based on Kretchmer's Grauvogl, Rademacher, Weidenreich or Sigaud's classification have a tendency or predilection to certain diseases or ailments, and are easy to diagnose. But the difficulty arises when similar symptoms are present in the large-built, generally broad-chested, big-bellied, apparently florid patients of the Typus Atheleticus (Stiller). Joachim drawing attention to these symptoms in such types warned the physicians never to fail to take the blood pressure readings. They are invariably hypotonics (if they show these symptoms), have a low blood pressure reading that cannot be corrected much, never have angiospasm with rise of blood pressure, never develop a high blood pressure even if they should suffer from diseases which otherwise have increased blood pressure as sequelæ, practically never get arterio-sclerosis, and if at all, in a mild form very late in life (Behr), and are, in spite of their pathological subjective symptoms which make their lives a misery, long livers, in fact first-class and very safe Life Insurance risks. (Barach). Thus, congenital Hypotonia becomes an essential problem of constitutional pathology and cannot be dealt with here in more detail. (See Aschner, Krise der Medizin, Lehrbuch der Konstitutions therapie, 1935).

Acquired Hypotonia can be generalised as in the congenital but the aetiology and classification is naturally different: 1. Temporary with acute or subacute stage. 2. Permanent arising out of the foregoing.

1. *Temporary*:—100 mm. in males and 95 mm. in females is found in all fevers and acute infections, sudden heavy haemorrhages, acute circulatory failures, heart failure due to vasomotor paralysis (Diphtheria, traumatic and anaphylactic shock, paroxysmal tachycardia). We found the B.P. especially lowered in Dysentery, Typhoid, Pneumonia and particularly Influenza. Therefore the need for circulatory stimulation.

2. *Permanent*:—There is no doubt of a relationship to endocrine disturbance as in Hyperthyreosis, Myxœdema and polyglandular dysfunction. It is pathognomonic for Tuberculosis, is present in the earliest stages, and as Brockmann points out, it is not the grade or extent of the lesion that matters but the tubercular intoxication.

There is an essential Hypotonia similar to essential Hypertonia. We know very little positive about its pathogenesis. It

is certain that the circulatory system alone is not to blame. Even the all dominating influence of the Vegetative Nervous System does not explain everything. The "aesthenia", or whatever term we may employ, extends to all tissues and organs. We find often hyperacidity and phosphaturia in Hypotonics which means a disturbance of the acid-base balance. Strangely enough, the Hypotonia syndrome viz. vertigo, headache, palpitation, fatigue, thoracic pressure, need for deep inspiration, psychic lability and irritability, impotence and lowered erectile power is also to be found in its counter-part Hypertonia. Kylin maintains that Hypertonia and Hyphotonia are twe different phases of the same disease (constitutional or otherwise). Hypotonia in youth and Hypertonia in old age. The only disease that must be kept in mind is Lymph-haematogenous Tuberculosis so admirably described by Starlinger. The differential diagnosis is not always easy.

We are still in the dark about the genuine causes of Hypotonia. V. Bergmann calls them the "vegetative stigmatised". It is possible that "constitution" plus endocrine dysfunction plus vegatative disturbance may be the right line of search. Martini and Pierach believe the adrenals to be the chief culprits. How exactly the adrenals, the Status Thymicolymphaticus (Joachim), the Thyreoids, the Gonads, the Pituitary are interdependent or singly or jointly responsible for this state is at present neither clear nor satisfactory.

Others believe that the possibility of some endogenous toxin lowering the B.P. is more likely. Heidenhain showed long ago that peptone injections could cause a prolonged drop in the B.P. Others followed up with various albumoses. Very likely on this basis we might explain the fact that in many alimentary diseases the B.P. is very low. Martini thinks the majority of Hypotonics are vagotonics (Bradycardia, cold hands and feet, tendency to alimentary unbalance). But we found also the opposite type-Sympathicotonics (heavy sweats, sparkling eyes, dilated pupils and sometimes tachycardia.) Curschmann, an experienced clinician, thinks that permanent Hypotonia is possible in some cases under certain conditions, in those who are constitutionally weak and of the sympathicotonic type. He believes it to be a defence mechanism eminently suited to such organisms, therefore not a disease, not even a tendency to disease, only a certain deviation of type in the framework of genuine constitutional stigmata.

Prognosis.—Is perfectly harmless and the comprehensive statistics of American Insurance Companies seem to favour Hypotonics. Barach calls them first class candidates. But Martini is right. These Hypotonics may live long and safely, but they are never happy, never enjoy full vigourous lives, are a torture to themselves and a problem to the physician who happens to be ignorant of the real basis of their misery. It is easy to dismiss a case as Hysteria. It does not constitute a cure. (Fahrenkamp). Unfortunately the symptoms are so vague and varied that unless Hypotonia is thought of, mistakes are bound to occur. We have seen such cases treated for years as Dyspepsia, intestinal toxicosis, far-fetched auto-intoxication treated with equally far-fetched and ambiguous auto-vaccines, chronic constipation treated with drastic cathartics, roughages and high colon lavages, others put to bed with alleged heart disease and others finally dubbed neuraesthenics, psychopaths, hypochondriacs and malingerers. We submit that no category of positive illness has been so neglected, misunderstood and sinned against. Especially Giertmiihlen has drawn attention to Hypotonia in early childhood. Indignant parents accused their children of becoming increasingly lazy, sleepy, disinclined to read, work or even play. There was Hypotonia in all these cases.

Treatment.—The idea is to raise by all available means the B.P., by drugs, Physico-therapy and hydrotherapy. We have tried almost every drug recommended in our meagre literature-Stimulants like Arsenic, Strychnine, Phosphorus, Phosphates in many forms. Calcium tablets and injections (excellent in, after and against Influenza), Caffein, Digitalis. Camphor is decidedly bad. Then organo-therapy Thyreoidin, Hypophysin, and Gonadal preparations of all makes and strengths. Smoking is definitely bad (Kuhn). Sympatol was decidedly good but is not available unless ordered specially, Racedin and Lilan (Samples, but not in stock), Atropine half mg twice daily, Bellergal and Bellafolin. Munk recommends Ant-Acid (Helfenberg) and Robbers, Grosse-Brockdorff and Kaldenberg, Varitol (Knoll). We were unable to try the latter drugs as yet.

The European literature naturally recommends Physico-therapy. We cannot afford it in small Indian cities, neither have we faith nor time for such expensive methods. Anything to improve circulation is good—oil massages, light exercises (heavy gymnastics are bad) and all such things that the patient can afford in the shape of money and the physician in the shape of

time. We recommend the Indian system of deep breathing though we do not teach it ourselves. The diet is mainly individual. Not too much meat, and Titro-Salz or Selarom instead of NaCl, one or two raw foods *i.e.*, fruit days in the week.

We regret to admit our dissatisfaction with our results with Allopathic drugs with the single brilliant exception of a combined course of Effecton and Tonophosphan. Having suffered the humiliation of seeing some of our early cases showing decided improvement under so-called "Biochemic" and "Homoeopathic" constitutional treatment in the hands of the local homoeopaths, we started using them ourselves. The morality or immorality of our action can be discussed another time since the results were better than before. Herzgold and Essentia aurea (Madaus) Angioton (Schwabe), Cactus Grandiflora and Crataegus in 3 X and 6 X dilutions and as oligoplexes gave good results in dominant cardiac symptoms; also Kali Carb and Kali Phos in higher and lower potencies. For impotency, lowered erectile power and failing Libido we have used the excellent but very expensive Effecton plus Tonophosphan and the incomparably cheaper but equally good homoeopathic Crataegus and Cactus mother tinctures in five minim doses. Lycopodium is slow but deep acting. Homoeopathic Phosphorus is dangerous in such cases. A certain amount of Homoeopathic study has been beneficial to us when our own drugs failed.

Finally we believe that the sphygmomanometer is as essential as the stethoscope when a variety of indeterminate symptoms are present—the more indeterminate the better.

Treatment of Œdemas met with in Tea-Garden practice in Assam

BY

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ŒDEMAS, both local and general, are frequently encountered and treated in Tea-Garden Hospitals in Assam. To describe the detailed treatment of all of them is beyond the scope of this short paper. In this paper an attempt has been made to give a synopsis of treatment of the cases which commonly occur and in which the œdema is more or less generalised and due to some constitutional causes. They may be divided into the following groups :—

(1) Œdema due to anæmia.
(2) Renal œdema.
(3) Cardiac œdema.
(4) Nutritional œdema.
(5) Post-dysenteric œdema.
(6) Œdema of unknown origin.

General principles of treatment in all œdemas are :—

I. Rest.
II. Elimination of fluids, by bowels, kidney etc.
III. Correction of the causes responsible for œdema by medicinal and dietetic measures.

I. **Rest.**—In all œdemas in general, heart is more or less involved either directly or indirectly. So rest in bed is an essential part of treatment. It is, no doubt, difficult to keep a coolie patient in complete rest but this should be enforced as far as practicable by constant vigilance. In chronic œdemas, the patient gets dyspnœa and mental restlessness resulting in complete insomnia or disturbed and inadequate sleep at night. In these cases rest must be ensured by good hypnotics and Medinal has been found to be very valuable in this respect. When other hypnotics fail, fifteen minims of Tincture of Opium, flavoured with syrup ginger or aurantii by mouth or one sixth grain of morphine sulph by subcutaneous injection often enables the patient to have a restful night. Opium should not, however, be administered daily but only when absolutely necessary.

II. **Elimination of Fluid.**—Elimination of fluid by bowels is effectively carried out by giving daily two ounces of saturated solution of mag sulph in the morning. I give this as a routine to all œdematous patients including pregnant women and the result has always been found to be satisfactory. Some cases do better with Pulv. Jalap Co. in two dram doses but this is not given to pregnant women. Elimination of fluid by kidney is encouraged by diuretics but chlorides are always withheld. Before employment of any drug to promote diuresis, examination of urine should invariably be done and a renal efficiency test carried out if possible in order to detect if any renal damage is present. Many authorities advise that it should be a principle in treating œdemas to keep the urine alkaline and this is really valuable. But ammonium nitrate, though an acid salt, has been found to increase the output of urine in fifteen grain doses dissolved in flavoured water taken 4 or 5 times a day. Digitalis is another valuable drug. It is not only a cardiac stimulant but also a good diuretic and is practically employed in the treatment of all forms of œdemas. Most effectual and cheapest is the powdered Digitalis leaf used in one grain doses. Guy's pill is an equally efficient preparation. A German mercury preparation 'Salyrgan' is the most useful remedy in my experience in eliminating fluid in all varieties of œdemas by promoting diuresis. Its contra-indications are glomerulonephritis, severe nephrosis and severe cachexia. Very rarely it flares up latent dysentery in post-dysenteric œdemas. Before the introduction of Salyrgan, 'Novasurol' was largely used. It was a more potent diuretic but owing to its toxicity its use has become almost obsolete. 'Mersalyl' is a British preparation equivalent to Salyrgan. It is non-toxic and an equally efficient diuretic. In some cases in which ascites is considerable, it sometimes happens that all attempts to procure a diuresis completely fail. This is probably due to compression of the kidneys or their vessels by abdominal fluid and it is a good plan to remove some fluid by paracentesis before employing a diuretic. In some extreme cases, where œdema in persistent and recurrent in spite of all treatment, the only way to give some relief to the patient is to promote drainage by Southey's Tubes or incisions into the sodden subcutaneous tissue of the dependent parts. Such a procedure involves some risk of sepsis and this type of cases almost always proves fatal in the end. During treatment of œdema cases, weekly weight

of the patients should be taken to estimate the degree of fluid elimination.

III. **Correction of the causes.**—It should be noted that purgation and diuresis are only palliative measures and unless the causes which are responsible for œdema are remedied, no amount of purgatives and diuretics will be of any lasting value. So along with the treatment outlined above, the causative factors must be carefully treated as noted below.

1. *Œdema due to anæmia*:—Forty grains of iron and ammonium citrate taken thrice daily or six grains of ferrous sulph taken twice a day readily cure microcytic and normocytic anæmia. Macrocytic anæmia should, however, be treated with marmite, fresh liver or liver preparations as well as stomach extract. Daily dose of fresh liver is 250 gms. One vial of oral liver extract (P. D. & Co.) is equivalent to 100 grms. of fresh liver. Hepatex, Hepatrat and campolon are commonly used liver preparations for parenteral use. Personally I use 5 c. c. of campolon intramuscularly on alternate days. Ventriculin (P. D. & Co.) is the popular stomach extract in use.

2. *Renal œdema*:—Ammonium nitrate has been mentioned in general treatment. Of other diuretics in use, urea and caffeine deserve special mention as they act very well in presence of renal defect. Urea 10 grms, caffeine 4 grains, syrup of aurantii 2 drams, Aqua to 2 ounces. This should be taken in half a tumbler of soda water 3 or 4 times a day.

3. *Cardiac œdema*:—Powdered Digitalis leaves and Guy's pill have been mentioned in general treatment. Digifortis, Diginutin and Digoxin are reliable products used now-a-days. I generally use Digifortis m. viii thrice a day. Digitalis, Squill, Caffeine, Theobromine sodium salicylate, Theophylline, Scoparium and the acetate or citrate of potash are among the best diuretics in cardiac œdema. In case of great distension of the right chambers of the heart, venesection should be done. If acute pulmonary œdema supervenes, morphine gr. $\frac{1}{4}$ with atrophine gr. $\frac{1}{50}$ should be injected.

4. *Nutritional œdema*:—Here the role of dietetic treatment is most important. The diet should be composed of adequate quantities of proteins, vitamins and minerals but no chlorides. A few words on dietaries will follow.

5. *Post-dysenteric œdema*:—Here œdema is partly nutritional and partly due to anæmia. Hence to classify it as a separate group is not very scientific. But as this œdema is very common and forms a large group in Tea-garden hospitals in Assam, I have preferred to put it in under a separate heading. This is a very resistant form of œdema and very difficult to treat. Not infrequently a vicious circle presents itself during treatment. These cases should be given a protein diet e. g. milk,

egg, fish, meat etc. in gradually increasing quantity and treated for anæmia by ferrous sulphate pills. Iron and ammonium citrate should not generally be given as it often flares up latent dysentery. A palatable preparation 'Hepatoglobin' containing both liver and iron is often suitable in post-dysenteric anæmia.

6. *Œdema of unknown origin* :—This is a small group of cases where cause of œdema cannot be ascertained and it baffles all forms of treatment. These cases ultimately succumb to heart failure or exhaustion.

Dietaries in Œdemas in General.—Protein is specially indicated in anæmic, post-dysenteric and nutritional groups and not contra-indicated in any. Vitamins particularly Vitamin 'B' complex and minerals particularly calcium and iron are indicated in all. Condiments especially salt and alcohol in any form should be avoided. In obese patients fats should be restricted. A light varied diet should be given according to the patient's need without irritating the alimentary tract and hindering digestion. Limited amount of fluid intake should be allowed according to the merit of each case; but fluids should not be completely withheld.

Dietary Sources.—*Vitamin 'B' complex* :—Yeast, legumes, cereal grains (unmilled), eggs. liver, fresh vegetables, milk, fresh meat, marmite, Bemax etc.

Calcium :—Cheese, milk, eggyolk, molasses, almonds, cocoa, chocolate, shrimp, oysters, beans, cauliflower, carrot, cabbage, spinach, beets bran, celery, dates, figs, lemons, lettuce, oatmeal, oranges, parsnips, pine apple, prune, berries, turnips, nuts etc.

Iron :—Asparagus, beans, bran, cauliflower, celery, lettuce, liver, oatmeal, nuts, beets, beef, cabbage, cucumber, oysters, raisin, spinach, apricots, beans (green), currants, dates, duck, goose, lamb, molasses, oranges, parsnips, peas, peppers, potatœs, radishes, rhubarb, tomatoes, turnips, whole wheat etc.

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Tuberculosis of the Larynx*

BY

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Ætiology.—Tuberculosis of the larynx as a primary affection is a rarity and so, for practical purposes non-existent. It is closely associated with some other tubercular process in the body and in majority of cases is a secondary manifestation in cases of pulmonary tuberculosis. Its progress depends upon the activity of the pulmonary focus. According to the old belief it originates from the deposit of T. B. laden sputum on the larynx, because one of the most favourite situations is the interaryteroid space which favours the accumulation of the infected sputum for a much longer time than elsewhere. The actual method of invasion is probably lymphogenous or haematogenous. This is supported by the following facts :—

(1) That, in one, the larynx never becomes tuberculous inspite of the positive sputum passing over it for years together, while in another, the larynx becomes infected early enough although repeated examinations of the sputum have been negative.

(2) The presence of healed tuberculous ulcers on post-mortem examination in patients dying of pulmonary tuberculosis.

(3) The preference of the inter-arytenoid space is probably due to the lymph stream being particularly slow in this locality.

(4) Just as the tuberculosis of the bones and the urogenital system can occur by the blood on the lymph stream, so the infection of the larynx can also occur by this route.

(5) The fact that the larynx is often found at first principally attacked on the same side as the affected lung in the unilaterally affected pulmonary cases also lends support to this view.

Frequency.—The frequency of laryngeal involvement in cases of pulmonary tuberculosis varies from 3-25% in different clinics and I find that the actual percentage of the really tuberculous larynges in the S. J. Tuberculosis Hospital, Delhi, is very small probably due to a selection of cases suitable for treatment

* Read before a meeting of the Delhi Branch of the British Medical Association.

admitted to this hospital. Majority of the cases of hoarseness are noticed in the cold weather and are of a simple catarrhal nature quickly clearing up under appropriate treatment.

Symptoms.—Depend upon the stage of the disease and the part of the larynx affected. According to Logan Turner, clinically we can divide the disease into 3 stages:—

(1) The stage of tubercle formation and acute congestion.
(2) The stage of infiltration and ulceration.
(3) The terminal stage of perichondritis and necrosis.

1. *The stage of acute congestion and tubercle formation*:—In a case suspected of pulmonary tuberculosis repeated attacks of hoarseness or an attack which has lasted for sometime should arouse the suspicion of laryngeal involvement, but a short lived attack of hoarseness may sometimes be due to a simple catarrh. If along with hoarseness there is dysphagia, for which there is no evident pharyngeal cause, it is strongly in favour of a tubercular onset. The laryngoscope here may show little more than acute catarrh and if this is not generalised or symmetrical, it is highly suspicious of a tubercular involvement of the larynx. Besides the catarrh, there may be an irregular swelling of the interarytenoid mucosa or a papillary formation in the same region. A unilateral congestion contrasting with the pallor of the surrounding mucosa is characteristic, while an appearance of prolapse of the ventricle is highly suggestive. Careful attention should be directed to any roughness or velvety appearance of the interarytenoid region, thickening or congestion of one arytenoid or of one ary-epiglottic fold, or a thickening and roughness of one vocal cord. If one vocal cord has a rounded appearance or has lost its mother-of-pearl-like polish, or appears to have been encroached upon by the ventricular band or lags behind in movement, there is good ground for suspicion.

2. *Stage of infiltration and ulceration*:—Here the symptoms become more prominent and are not fleeting in nature. The voice becomes hoarse and toneless, although complete aphonia is rare. Cough is now more troublesome and becomes painful. Dysphagia is present particularly if the upper part of the larynx is involved and is specially marked on swallowing fluids. At this stage infiltration, ulceration, and the presence of tuberculomata are marked features. Infiltration is particularly marked when the arytenoid region is affected and is seen as a pale pyriform swelling and when the epiglottis is affected, it has a very characteristic appearance, being seen as the end of the tongue or

like the lips of the os uteri. Ulceration is frequently present on the vocal cords which look raw and red and have an irregular or serrated outline. Ulcerations in the infiltrated area give a mouse-nibbled appearance. Papillomatous vegetations may be seen in the arytenoid region. Due to infiltration paresis of both the vocal cords, the glottis may appear spindle-shaped on phonation or one of the cords may appear to stand in a cadaveric position due to the involvement of the recurrent laryngeal nerve by the thickened pleura or the glands in the hilum.

3. *The Terminal Stage of perichondritis and necrosis*:—During the terminal stage all the symptoms are more urgent and painful. Voice completely disappears, cough is incessant and toneless, dysphagia, which is particularly marked for fluids becomes aggravated. Here dyspnœa becomes a well marked feature and there is profuse purulent expectoration even containing pieces of the exfoliated cartilage.

Laryngoscopy reveals areas of marked œdema and a pear-shaped swelling may be present over one of the arytenoids, and the cord originating from its anterior end appears as a motionless granular band. Swelling of the lateral wall of the larynx and the ventricular band denotes a process of perichondritis in the thyroid cartilage. The condition is so marked that the larynx may be seen as a fungating mass with a stenosed crater.

Diagnosis.—Early diagnosis is very important and a careful laryngoscopic examination is of vital importance.

Certain features of laryngeal diseases are distinctive.

1. *Voice*:—While voice in phthisis laryngea is weak, hollow and painful, in syphilis it is strong, rough and raucous and is painless. Hoarseness and dysphagia in a case of pulmonary involvement is highly suggestive of a tubercular onset in the larynx.

2. *Dysphagia*:—In phthisis laryngea, dysphagia is for fluids, in cancer for solids, in syphilis and lupus of the larynx there is hardly any dysphagia.

3. *Pain*:—While it is a marked feature in phthisis laryngea, it is very insignificant in syphilis and lupus.

4. *Emaciation*:—While well marked in phthisis laryngea, is not a feature of syphilis or lupus. It may be a feature of cancer.

5. *Skin*:—While affected in syphilis and lupus, is unaffected in tubercle.

6. *Nose*:—Shows no evidence of disease in phthisis laryngea, while it may show the affection in lupus and syphilis.

7. *Pharynx*:—Is characteristic in lupus, pale in tubercle, vermilion red in syphilis or may have mucous patches in syphilis.

8. *Larynx*:—Lupus and syphilis affect the front of the larynx, phthisis attacks the back part.

9. *Ulceration*:—In phthisis laryngea, is pale and superficial with inactive edges, in syphilis the edges are punched out and deep with well marked reaction all round. Cancerous ulcers are raw and red with overgrown edges in upper part of the larynx, but in vocal cords they are of a dirty white colour. Lupoid ulceration is very superficial, healing in one part and cicatrising in another.

Acute Catarrhal Laryngitis.—There is a diffuse redness and in severe cases even ulceration, but the ulceration in common catarrh is almost always symmetrical, and occurs in people who are susceptible to hoarseness every time they catch cold.

Innocent Tumours of the Larynx..—Vegetations in the inter-arytenoid region are commoner in phthisis laryngea, while papillomatous and other innocent tumours are found in the anterior part of the vocal cords. Moreover the mucosa from which the papillomata grow is healthy, while in tuberculosis it is diseased.

Laryngeal tuberculosis can take the appearance of a warty subglottic unilateral affection. It may resemble a ventricular tumour. In both instances it looks like an intralaryngeal epithelioma. It is only by careful examination that the mistake can be avoided. A radiograph of the larynx can be of some help in the diagnosis of cancer. Even in cases in which a diagnosis of epithelioma seems obvious, a careful examination of the lungs should be made and thoroughly taken into consideration.

Course of the Disease.—The disease usually follows the progress of the primary pulmonary condition. It improves either by itself under the usual anti-tubercular treatment or under surgical measures,when pulmonary tuberculosis becomes inactive. Under the influence of pulmonary relapse even healed ulcers become active once again. Of the hæmatogenous generalised form, the cases in which there is no miliary pulmonary process have the best chance. We are powerless against the generalised laryngeal condition with miliary tuberculosis.

Prognosis.—The prognosis is more favourable than it appeared a few years ago. There is a certain connection between the course of laryngeal and pulmonary tuberculosis. The appearance of laryngeal complication is evidence of the lowering of the vitality of the patient and activation of the pulmonary process.

Tubercular laryngitis does not necessarily determine a fatal termination of the affection. In general, laryngeal tuberculosis in patients of 30—40 years of age have a better prognosis than in young people, and in children it is a grave omen. Cases of circumscribed and localised tuberculosis of the cavum laryngis follows a benign course and the best cases are of the localised, infiltrated and ulcerative tuberculosis of the vocal cords. The worst prognosis is found where miliary tuberculosis appears. Somewhat better but still grave, is the prognosis in the infiltrative and ulcerative generalised form.

Infiltrative and ulcerative tuberculosis of the epiglottis when not limited to a marginal focus has also a bad prognosis. The most favourable site of onset is the vocal cords and the next the inter-arytenoid region. The firmer and the more fibrous the type of infiltration, the better is the prognosis. Œdema and ulceration render the prognosis much less hopeful. Generally the progress of the laryngeal condition follows the progress of the pulmonary condition but not always so, otherwise healed laryngeal lesions would not be found in patients dying of pulmonary disease. On the other hand the lung condition never improves, should laryngeal lesion progress. The onset of dysphagia is a bad omen. Any debilitating factor such as pregnancy has an unfavourable influence over the progress of the case. Mixed infection such as syphilis increases the gravity of the case.

Treatment.—1. Prophylaxis :—All causes leading to acute and simple chronic laryngitis should be obviated where possible. Nasal obstructions, accessory sinus suppuration, adenoid vegetations and enlarged and probably tuberculous tonsils should be removed. The use of intra-tracheal injections or spraying the larynx with a 5% menthol in paraffin in cases of pulmonary phthisis showing the slightest signs of catarrh, will do much to reduce the onset of tuberculous infection and an occasional application of an astringent antiseptic such as 2% Argyrol to larynx will be serviceable in relieving the catarrh. Atmosphere free from dust as far as possible and residence at not too great an altitude are preferable.

2. Curative:—Laryngeal cases should avoid sea-side, hot and spiced food and the use of alcohol and tobacco. In treating laryngeal tuberculosis it should be remembered that all the measures that go towards improving the lung condition have a beneficial effect on the larynx also.

Vocal Rest:— This is of the utmost importance. Combined with a good sanatorium regime this by itself can cure the laryngeal affection without any other treatment provided it is long enough.

Artificial Pneumothorax:— By putting the lung at rest and improving its condition it considerably helps the laryngeal affection. Its induction is primarily based on the pulmonary and general condition of the patient. A satisfactory collapse of the diseased lung, be it by whatsoever measure *e.g.* artificial pneumothorax, phrenic avulsion or extra-pleural thoracoplasty has a considerable beneficial effect on the laryngeal lesion.

Galvano-Cautery:—Is particularly useful in selected cases and the chief indication for its use is dysphagia. After the application of a 2% cocaine, the sharp pointed cautery almost at white heat is driven through the margins of the ulcer under indirect laryngoscopy. Two or three punctures are made. Strict silence is maintained for a few days during which period an oily spray containing chloretone is used. A good inflammatory reaction round the puncture indicates a favourable case for the use of the cautery. There is however one contra-indication. Endolaryngeal cauterisation—urgency excepted—may lead to an undesired activity of the pulmonary condition, if the process is adopted before the pulmonary process becomes inactive. Besides cauterisation, curetting the ulcer with a double curette followed by the application of a caustic like 50% lactic acid are beneficial. Other operative measures like curative tracheotomy, laryngofissure and laryngectomy have no place in the treatment of laryngeal tuberculosis. Before cauterising an arytenoid ulcer anaesthesia by the injection of the superior laryngeal nerve will be more helpful than the application of cocaine, as it reduces the post-operative pain much more effectively and for a much longer period. Indirect laryngoscopy is preferable to Killian's suspension method which is too exhausting for the patient who is already so ill.

Artificical Sun Light:—Sun light in the treatment of laryngeal tuberculosis may be natural or artificial, local or general. Strandberg of Copenhagen, the leading authority on the subject advocates generalised ultra-violet light treatment as against local light applications. The type of lamp used at the Finsen Institute is the carbon arc. Baths are given from 5 to 10 minutes at first, gradually increasing to 2½ hours. It is usual for a slight rise of temperature to take place after the light bath but it is no

contra-indication to continue the treatment. In poorly nourished and emaciated cases with extensive pulmonary infection carbon arc light treatment does not do any good and may do a lot of harm. A. J. Semach considers natural sun-light harmful in tubercular disease of the larynx and regards artificial sun-light as the method of choice. Ultraviolet light has an analgesic action and is therefore of value in cases of dysphagia. Instruments for the direct local irradiations of the larynx have been devised. Certain leading specialists in Europe like Sir St. Clair Thomson and W. G. Howarth do not consider this method of treatment to have any particular advantage over the conservative lines of treatment and are of opinion that this method should be employed as an adjuvant with the other methods of treatment.

Oil of Chaulmoogra:—Some specialists advocate local use of oil of chaulmoogra on the basis of its efficacy in leprosy and for this purpose recommend the Burmese oil of Chaulmoogra rather than the Indian variety. It is applied either, in the diluted form (10 to 20% in mineral oil) or full strength dropped into the larynx or applied with a swab once or twice a week. It is found soothing in cases of dysphagia.

Injection of Gold Salts:—These in the form of sanochrysin or Oleo-Solganol-B have a beneficial effect due to a general stimulation of the whole of the reticulo-endothelial system rather than by any specific action on the tubercular laryngeal process.

3. Other Subsidiary Measures.—They are those advocated for the treatment of pulmonary tuberculosis in general. Local cough if irritable should be subdued by the use of simple lozenges containing glycerine, carbolic, menthol, liquorice, codeine, heroin, morphia or cocaine but these sedatives should be avoided as far as possible. For dysphagia local insufflation with orthoform and anaesthesin half an hour before the meal is beneficial. Sometimes relief for taking fluids can be found by lying prone over the bed, the head projecting beyond it and drooping downwards and taking the fluid nourishment through a sucker. Where dysphagia is very severe relief can be obtained by injecting superior laryngeal nerve with alcohol or novocaine. For dyspnœa where the strider becomes marked relief may be obtained by a median tracheotomy. The use of tuberculin therapy is still a controversial point.

Acute Miliary Tuberculosis of the Larynx.—The condition is due to pharyngeal tuberculosis extending to the larynx. The region affected is the laryngo pharynx and the epiglottis. One sees a swollen mucous membrance through which the tubercles appears as yellowish dots breaking later on to form confluent ulcers. Prognosis is extremely grave and treatment in only palliative.

Modern Conceptions in Treatment By Vitamins

BY

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I PROPOSE in this paper to describe briefly what is now the accepted place of vitamins in the field of treatment. At the present time with the rapid progress in the ideas of treatment and with the advent of new remedies, the mode of treatment of diseases is fast being revolutionised. Many diseases which were so long considered incurable or curable with difficulty, have now become amenable to treatment with these remedies. During the present century biochemistry has grown out of physiological chemistry and includes the important subject—Vitamins, the foundations of which Gowland Hopkins in 1906 did so much to establish. This gave the clue to the nature and so to the prevention of 'deficiency' diseases such as scurvy, beri-beri and rickets. The researches of Edward, May and Mellanby have also added much to our knowledge. We are indebted to works of Stepp, Gyorgy and Winders for the knowledge that vitamins are organic compounds which must be continuously supplied in very minute amounts to the animal organism from without; that they are absolutely necessary for the maintenance and increase of cellular substances and to the normal functioning of vital processes. We are no less indebted to Sir Robert McCarrison for his valuable contribution.

In 1880, the Japanese physician Takaki realised that beri-beri was caused by a deficiency in diet. Eijkman, while on service with the Dutch colonial army in East Indies in 1883, was amazed to find numerous cases of beri-beri among the prisoners who were in his charge. He began experiments on two sets of fowls, feeding one on polished and the other on unpolished rice and came to the conclusion that beri-beri was caused by the absence of some element present in the pericarp of rice. Eijkman continued his researches from 1889 to 1897. Funk in 1911 extracted the anti-beri-beri element from rice husks and named it 'Vitamins'.

Now we come to the consideration of vitamins one by one.

Vitamin A or the Anti-Xerophthalmic Vitamin.—It is naturally found in the liver of fish, butter, egg-yolk, cream, green-vegetables, fruits, *e.g.* oranges, peaches, etc. All of these contain an orange-red pigment which is the pro-vitamin in the

synthesis of vitamin A and is transformed into vitamin A in the animal body.

It was previously supposed that vitamins A and D are one and the same. In their main source, cod liver oil, these two vitamins are closely associated and their separation and identification as separate chemical entities were correspondingly difficult.

Deficiency of vitamin A results in reduced resistance of the skin and mucous membranes and manifests itself clinically and pathologically in human beings by affecting the epithelial tissues in a specific manner. There is a substitution of stratified keratinizing epithelium for normal epithelium in various parts of the body *e.g.* respiratory, alimentary, genito-urinary tracts, in the eyes and in the para-ocular glands. In view of this action, vitamin A has been termed the epithelial-protection vitamin. The destruction of the epithelium due to lack of factor A in the pelvic ureter, may help in the formation of calculi, mostly phosphatic in composition. The changes in the different parts of the body render them lees resistant to bacterial invasion and more susceptible to infection in general.

The administration of vitamin A therefore is rightly called for in keratomalacia, Xerophthalmia, catarrh of the respiratory passages, colpokeratitis, leucorrhœa etc.

Spence has observed that "healing of an artificially produced lesion (burn) is much slower than normal in persons deficient in vitamin A. The urine often contains excess of epithelial cells, even pus". (Ungley, *Lancet*, April 16, 1938.)

Many diseases of our women and children are directly or indirectly caused by a faulty or deficient diet. According to Rit, a deficiency of vitamin A plays an important role in the causation of infantile diarrhœa in Bengal and he treated with encouraging results a number of cases with vitamins A and D. Mudaliar and Menon believe that during the ante-natal period, a deficiency of vitamin A greatly predisposes the mothers to puerperal infection and they have had an uniformly good result by the administration of cod liver oil to a number of cases both during and after labour, as also in certain prolonged fevers associated with signs of sepsis during the puerperium. Now-a-days it is claimed that a certain synergetic action of both the vitamins (A and D) exists if they are present in suitable proportions as for example in cod-liver-oil. Disturbance of this proportional balance may lead to even antagonistic effect and render both partially inert. A definite antagonism exists between A and C mixtures of different vitamins on the market and should be accepted with caution.

Vitamin D or the antirachitic vitamin, is contained in certain fats notably cod liver oil.

Vitamin D is essential for the proper calcification of bones and for the formation of enamel on developing teeth and actually controls the deposition of calcium and phosphorus in the tissues. Infantile tetany and rickets are closely associated and this suggests that the lowering of the blood calcium in the former is connected with a deficiency of vitamin D.

Clinical indications of vitamin D are : (1) Disturbances of calcium and phosphorus metabolism of the bones and teeth *e.g.* rickets, osteomalacia, osteo-porosis, osteoarthropathy, badly uniting fractures, dental hypoplasia ; (2) Increase in irritability due to decrease in blood calcium *e.g.* spasmophilia, post-operative tetany and its sequelae (cataract, clonic convulsions) ; (3) In tuberculosis with the idea of a more rapid calcification of the tubercular foci.

Vitamin B_1.—This vitamin or the anti-neuritic vitamin is available in rice-husks, yeast, wheat bran, germinating seeds, carrots, tomatoes, oranges etc. It has been synthetized by Andersay and Westphal of the 'Bayer' laboratories in 1936. It is soluble in water and alcohol containing water but insoluble in oil and is destroyed by heat.

Clinically, vitamin B_1 deficiency is manifested by neuritis and neuralgias, cardiovascular changes, aphonia, anorexia etc. The deficiency is observed generally in alcoholics, infants, pregnant women and in persons suffering from gastro-intestinal disorders.

Vorhans, Williams and Waterman (*Jour. Amer. Medl. Assn.*, 1935) had great success in using vitamin B_1 in the treatment of clinical neuritis and some cases of undiagnosed gastro-intestinal dysfunction. Vitamin B_1 has also been used by Weiss and Wilkins in the treatment of various cardiac disturbances (*Tr. Assn. Am. Phys.*, 1936 and *Am. Int. Med.*, 1937.)

Vitamin B_1 must be more directly concerned in the physiology of the nervous system than is any other vitamin. After administration of vitamin B_1, the sudden return to normal function before morphological repair has been initiated, warrants this conclusion (*Medical Annual*, 1938). It has been definitely established that cardiac lesions in beri-beri are due to a deficiency of vitamin B_1. Lately it has been proved that the circulatory symptoms rapidly respond to injections of vitamin B_1 in its pure form. H. Hasimoto (*American Heart Journal*, 1937, Vol. 13, pp. 580) describes how quickly the symptoms are relieved in a case of polyneuritis and cardiac failure in a Japanese boy of 15 years. Injections of a concentrated preparation of vitamin B_1 in doses equivalent to 1 mg. of the crystals daily, cleared up the symptoms within a few days. By the 7th day of treatment, X-ray appearance of the heart was normal, œdema was absent and the boy had apparently completely recovered.

Hawes, Monterio, and Smith report the gratifying results obtained in the treatment of severe cases of beri-beri with definite cardiac lesions. The series of patients treated by them were 100 severe cases and all of them were submitted to Betaxin (vitamin B_1 'Bayer') treatment. Out of these 100 cases, 23 died and the remainder made complete recoveries. About the death of these patients, the authors are of opinion that at least 80 to 90 per cent of cases would have died with any other variety of treatment. The mortality rate has however dropped still further as experience of this method of treatment has been gained and none of the last 10 very severe cases has died. The authors are also of opinion that enormous dosage of vitamin B_1 was sometimes required to get satisfactory results and that it did not produce any undesirable result.

> " F. W. Clements of the School of Public Health and Tropical Medicine in Sydney has carried out a series of experimental observations on tropical ulcer. Although seasonal incidence, debility and trauma were predisposing factors, the outstanding factor was diet. The conditions predisposing to tropical ulcer are associated not with a complete but probably with a partial deficiency of the vitamin B complex and with a diet rich in carbohydrates but low in protein and fats ".

P. M. Joffe and N. Jolliffe have studied the gastric acidity in 105 alcoholics with observations on the relation of the B vitamins to achlorhydria. The expected incidence of such a condition in a normal group of the same age and sex would be 11 per cent; in this group, achlorhydria occurred in 33 per cent. Achlorhydria was not related to the degree or duration of the alcohol addiction. The authors considered the possibility of an achlorhydria-preventive factor being a part of the vitamin B complex but not identical with either the vitamin B or the Pellagra-preventive factor. They opine that alcohol in itself does not cause achlorhydria in the alcoholics but an achlorhydria-preventive factor is probably present in vitamin B complex.

A recent conception is that vitamin B_1 influences carbohydrate metabolism and thus helps to split up acetyl-formic-acid. In countries like India where a larger amount of carbohydrate is consumed than usual, the intake of vitamin B_1 must necessarily be increased. Vitamin B_1, although it influences carbohydrate metabolism, has an entirely different action from insulin. But the vitamin is nevertheless essential for the treatment of diabetes. Another function of vitamin B_1 is that it acts to eliminate adenyl acid, a pre-stage of uric acid. In cases of gout therefore an injection of vitamin B_1 means an improvement of the acute attack.

Vitamin B_1 is an important factor in promoting normal growth and gain in weight in infants and children. As it is

concerned with carbohydrate metabolism, its deficiency has been shown experimentally to lead to incomplete oxidation of carbohydrate intermediates in the central nervous system (Peters, *Lancet*, p. 1161, 1936.)

Vitamin B_2 Group.—This group includes 'lactoflavin'. Its natural occurrence is in vegetable and animal products, especially yeast, liver,milk, eggs, etc. (The flavines obtained from these substances are in all probability chemically identical with "lactoflavin" prepared from milk.)

In "lactoflavin" deficiency, growth in rats is delayed or arrested and the animals die sooner or later. Skin affections of a non-specific character occasionally occur.

The clinical evaluation of B_2 is still in its beginning. Disturbances in growth in infants and dermatoses due to an unbalanced diet consisting chiefly of milk or carbohydrate are said to respond well; so also do cases of secondary anæmias. 'Lactoflavin' being concerned in carbohydrate metabolism (proved by animal experiment), may be tried in the treatment of 'diabetes'. Of course it cannot do away with the specific treatment by the pancreatic hormone—insulin. But a combined treatment by both will no doubt reduce the amount of insulin required. One of the main defects of Indian (particularly Bengali and Madrasi) diets is a low vitamin B complex content. This deficiency in all probability plays an important role in and partly accounts for the great prevalence of digestive troubles in these two great provinces in India. In his experimental animals because of the high incidence of digestive disorders, McCarrison was led to believe that an unrestricted supply of vitamin B_1 is very essential in maintaining the normal state of gastro-intestinal tract and that its deficiency is a common cause of gastro-intestinal ailments. Baker, Wright and Drummond (1937) have found that the main effect of a prolonged vitamin B deficiency diet, is a high incidence of digestive disorders. Swedish research workers carried out their observations on 17,400 healthy and sick persons and they are of opinion that a vitamin B deficiency diet is an important factor in the production of gastro-intestinal diseases like colitis, constipation, diarrhœa etc.

Certain types of anæmia have also been found to follow a vitamin B deficiency diet and Napier found that a diet rich in vitamin B complex effected a cure in certain anæmias in Bengal. Impaired digestive capacity, constipation, skin affection and deficient growth from which many children in this country suffer are due to a deficiency of vitamin B complex in the milk. Basu (1938) believes that the addition of vitamin B_2 has a retarding effect on the experimental production of nodular leprosy in white mice and obtained improvement in several leprosy cases with

anæsthetic patches by treating them with vitamin B. One of the important factors predisposing to anæmia of pregnancy is surely a deficient diet during the ante-natal period. Wills found that vitamin B deficiency was the cause of a kind of macrocytic anæmia in Bombay.

Vitamin C.—According to Ungley this vitamin "plays a role in the respiration of cells, in the process of oxidation and reduction, and is responsible for the production and maintenance of the intracellular cement substance. Deficiency results in imperfect dentine, osteoporosis and fragile capillaries".

Gyorgyi discovered "ascorbic acid" which abounds in oranges, bananas, lemons, pineapples, grapes, paprixa and which he identified as vitamin C in 1932. Physical and chemical properties: colourless crystals easily dissolving in water; easily oxidised especially at a higher temperature and in neutral and alkaline solutions; keeps indefinitely in solid form and in aqueous solution if air is excluded. It may be mentioned here that large doses of vitamin C (and also B_1) do not produce any toxic bye-effects. The excess of ascorbic acid (and B_1) not required by the body is excreted by the urine. Therefore, while administering these vitamins, the question of hyper-vitaminosis in human beings might safely be eliminated. Vitamin C is clinically indicated in the following conditions:

(1) Infectious diseases *e.g.*, diphtheria, pneumonia, typhoid and typhus fever, etc.

(2) Hæmorrhagic diathesis, hæmophilia, hæmorrhages of the lungs, uterus and in the digestive tract.

(3) Scurvy and pre-scorbutic conditions in infants (anæmia).

(4) Hypovitaminosis in pregnancy,in the lactation period.

(5) Disturbances in mineral metabolism *e.g.* poorly healing skin and bone injuries, dental caries.

The various pathological conditions in which the synthetized vitamin C preparations have been used so far and which have been reported in the medical journals are: pregnancy gingivitis, enteric fever, lobar pneumonia, climacteric disturbances, hyperemesis gravidarum, eclampsia, habitual abortion, cataract, ulcerative colitis, intestinal hæmorrhages, arsenobenzol intolerance, prophylactic against serum—shock, tuberculosis etc.

It will not be out of place to summarize a few reports on the above indications from the medical press.

Stroh treated some cases of pregnancy gingivitis with C vitamin ('Cantan' Bayer), the dosage being 2 tablets per day. The results were extremely gratifying. The complaints

disappeared within 2 weeks. The gums became normal. The author considers 'cantan' therapy to be almost diagnostic of pregnancy gingivitis.

Najile-Farah reports of having treated 15 cases of enteric fever by intravenous injections of suprarenal cortex extract and vitamin C. In all these cases (except one) an immediate improvement followed. Between the 3rd and 7th day there was a gradual fall of temperature to normal. Intravenous injections of suprarenal cortex extract in doses varying from 5 and 20 c.c. (usually in the daily dose of 10 c.c.) depending upon the age and condition of the patient are given with 500—1000 mg. of vitamin C, the two preparations being mixed in the same syringe. Administration of suprarenal cortex extract and vitamin C is continued for 5—12 days and is followed by 2 intravenous injections daily of 100 mg. of vitamin C alone for at least 7 days. The author considers that subcutaneous or intramuscular injections are either less or not at all effective.

Voge treated with vitamin C, 37 cases of pneumonia. Bohnholtzer who has also treated several cases of pneumonia with vitamin C fully confirms the findings of Voge. In most of his cases Voge used Bayer's vitamin C 'Cantan'. The method adopted by Voge was that as soon as diagnosis of pneumonia was confirmed the patient was given a subcutaneous injection of 200 mg. of vitamin C. It was continued for the next 5—8 days, a daily injection of 300 mg. increasing according to requirement upto 500 mg. The author recommended the administration of vitamin C in 3 divided doses rather than in one dose, since in his opinion the results of divided doses were decidedly superior to that of a single dose. In most cases the temperature came down to normal or nearly normal on the day following the beginning of treatment. There was a decided subjective improvement in the condition of the patient immediately following this method of treatment. The progress of the lung condition however took the normal course. In none of the cases thus treated was there any complication. Nicita found that the elimination of vitamin C through the urine is diminished in patients who are suffering from pulmonary tuberculosis. It was proportional to the seriousness of the general and pulmonary conditions of the patients. The consumption of vitamin C by the body is increased, on account of the presence of a chronic tuberculous toxæmia. The author points out the advisability of administering liberal amounts of vitamin C to patients suffering from pulmonary tuberculosis.

Faltehanse treated a 45-year-old lady suffering from climacteric disturbances with loosening of teeth and bleeding of gums with Cantan (vitamin C). She was given 1 tablet thrice daily for 14 days. After 8 days improvement was noticed. The bleeding ceased, the sore gum became healthy and other accompanying complaints disappeared and the patient regained her health soon.

Schmidt tried vitamin C both in the treatment of vomiting of pregnancy and mild cases of pregnancy toxicosis, such as giddiness etc. Especially good results were obtained with Cantan 'forte' (one ampoule injected every second day) in 5 women who had been suffering from 3—4 weeks from a very severe form of pregnancy vomiting. Vomiting became less frequent after the 3rd or 4th injection and the results were extremely gratifying.

Equally satisfactory results were obtained by the author in the treatment of habitual abortion.

Konard (1935) stresses the importance and advantage of vitamin C administration with injections of glucose and mag. sulph. in the treatment of eclampsia. The author used this combined remedy successfully in a number of cases and recommends this method of treatment as very helpful.

Vitamin C and Cataract.—Silva and Novaes published a paper on the above subject, an abstract of which has appeared in the *B. M. J.*, Feb. 19, 1938. They state that the lens, being completely avascular and suspended and immersed in the aqueous humour, must derive its nourishment from the constituents of this 'secreto-dialysata' which in turn is derived from the blood. Apart from traumatic cataract (including that due to X-rays, ultra-violet rays or radium) the more usual forms of cataract are accompanied by changes in the composition of these two media. The only way in which the lens can react to these changes is by using some of its transparency—that is, by the formation of opacities of one kind or another. The chemical changes in the blood which occur in metabolic disturbances which accompany such conditions as diabetes, nephritis etc. cannot entirely account for the changes in the lens. The occurrence of post-asphyxial cataract is a proof that lens opacities can be produced by oxygen deficiency, and, provided the changes are not too advanced, their reversal may be accelerated by the administration of oxidising substances. It has been shown that the lens absorbs oxygen and gives out hydrogen, so that its metabolism may be likened to a form of respiration. Vitamin C exists in three forms: (1) reduced; (2) oxidized, but reversible, and (3) oxidized and fixed. In the aqueous humour it occurs normally in the reduced form. Hence, vitamin C forms part of a natural oxidation-reduction system.

Silva and Novaes have treated over 20 cases, with vitamin C some of which they describe in detail; many were greatly benefited, but in others the process had gone too far for any hope

of improvement. The authors are convinced that medical treatment should be tried in all early cases, and they consider that upto the present, vitamin C is the substance which best assists the 'respiration' of the lens. They give intravenous injections because it has been shown that vitamin C may under certain conditions be destroyed in the alimentary canal.

Vitamin C has been successfully used by Hetengi (1935) in ulcerative colitis and in alarming intestinal hæmorrhage by Boger and Schroeder (1934). In post-partum hæmorrhage (not due to uterine subinvolution), Klingspohr (1937) employed vitamin C with satisfactory results.

Vitamin E or Anti-sterility Vitamin.—According to Weston and Levine this vitamin is of importance for reproduction *i.e.*:

(1) for normal maturation of germ cells in the male.
(2) for normal placental function in the female.

But the absolute necessity of this vitamin for human beings has not yet been definitely proved.

In conclusion, I think, these findings might be to some extent helpful to the further use of vitamins in the various indications already mentioned and to those using vitamins for the first time, this paper might prove of some help. It will surely be a source of satisfaction to me to see workers in this country engaged in elaborating the uses of vitamins in the wide field of treatment.

I believe I shall be failing in my duty if I do not express my grateful thanks to Dr. A. G. Brocke, D.Sc., (JENA), for his valuable advice and guidance in compiling this paper.

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