complex, but nevertheless careful consideration is necessary in deciding whether bacteriological control of bacillary dysentery is a practical proposition, because only thorough and intensive measures are likely to be successful. The main objections to embarking on an energetic campaign to control bacillary dysentery are: In this country the disease in adults is usually trivial, perhaps of comparable incapacitating value to the common cold, and many cases do not report for medical attention; many carriers exist; apparently healthy people may be segregated for relatively long periods; and the clinical course of the disease is readily controlled by sulphonamide therapy. It is, however, recognized that dysentery in infants, particularly undernourished infants, may be a serious and even fatal disease. Moreover, recent developments in laboratory technique have provided valuable information on the epidemiology of the disease and the detection of carriers has been greatly simplified; while the sulphonamides have proved extremely valuable in clearing all types of infection except Sonne. It should therefore be possible for us eventually to control bacillary dysentery provided all outbreaks are subjected to strict bacteriological control. Dramatic results must not be expected, as, in view of the wide distribution of the disease, its elimination from this country will undoubtedly prove a slow process.

Summary

The frequency of the carrier in bacillary dysentery and the intermittent excretion of *Bact. dysenteriae* have been readily demonstrated by the use of the desoxycholate-citrate medium.

Sulphaguanidine and succinyl-sulphathiazole have not proved successful in clearing persistent carriers of *Bact. dysenteriae* (Sonne).

The control of dysentery has been discussed and more stringent criteria recommended to determine freedom from infection—viz., 12 successive negative results.

I wish to thank the many persons who have provided valuable assistance during this investigation, particularly in the collection of the numerous specimens and the administration of the sulphonamides, and also Col. J. S. K. Boyd for much helpful criticism.

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PLASMA ACID PHOSPHATASE IN CARCINOMA OF THE PROSTATE AND THE EFFECT OF TREATMENT WITH STILBOESTROL

BY

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Kutscher and Wolbergs (1935) found large amounts of a phosphatase, having an optimum activity in the region of pH 5.0, in normal human prostate tissue and seminal fluid. Pursuing this investigation, Gutman, Sproul, and Gutman (1936) detected the enzyme in carcinomatous prostatic tissue and at the site of skeletal metastases secondary to carcinoma of the prostate.

Gutman and Gutman (1938) further observed an increase of "acid" phosphatase in the serum of patients with metastatic carcinoma of the prostate gland, and suggested that its estimation was of diagnostic value: patients with carcinoma of the prostate without bone metastases did not show an increase of acid phosphatase. Huggins and his collaborators (1941, a, b, c), at the University of Chicago then gave evidence that carcinoma of the prostate, in common with adult prostatic epithelium, is responsive to alterations in the level

of androgenic hormones in the organism. Injection of androgen caused a rise, and castration or injection of oestrogen a fall, in the plasma acid phosphatase. A study of the effect of castration and of oestrogen administration as a means of clinical management of advanced prostatic carcinoma showed that the improvement obtained was more than a palliation. Only 5% of the cases treated derived no benefit. Of the remainder, half showed a pronounced improvement, which was not, however, sustained for longer than 18 months. The others showed a more prolonged improvement.

The above work has been amply confirmed by other American authors: Sullivan *et al.* (1942) on the effect of castration; Kahle, Ogden, and Getzoff (1942) on the effect of stilboestrol; and Munger (1941) on that of x-irradiation of the testes. A review of the whole field has recently been given by Haddow (1943).

In preliminary investigations in these laboratories acid phosphatase estimations were performed on the plasma of normal controls, of patients with conditions other than carcinoma of the prostate, and of cases of carcinoma of the prostate with and without metastases in bone. Estimations were also carried out on normal human seminal fluid and in a case of eunuchoidism. In later work at the Royal Cancer Hospital more detailed investigations have been made on cases of carcinoma of the prostate and the effect of treatment with stilboestrol.

The cases now presented are unselected, although in one respect atypical in that they include a high proportion with osseous spread. No case was treated by x-irradiation of the testes or by castration, and in order to obtain clear results in cases in which the prostate had been irradiated previously, time was allowed for the full effect of this procedure to be assessed before oestrogen therapy was begun.

Method of Estimation of Acid Phosphatase: Principle

The pH optimum of acid phosphatase is between 4.5 and 5.0; that of alkaline phosphatase is between pH 8.4 and 10.0, depending upon the substrate used. Because of this great difference it is possible to estimate one phosphatase in the presence of the other merely by allowing it to act upon the substrate at its characteristic optimum pH. Thus the alkaline phosphatase in blood plasma is inactive at the reaction at which acid phosphatase operates best, and vice versa.

Method

The procedure for acid phosphatase determination is identical (and the solutions are the same, with the exception of the buffer) with that for alkaline phosphatase (see King, Haslewood, Delory, and Beall, 1942). An incubation time of 1 hour at 37° C. is normally used. The results are expressed in terms of units which are equal to mg. of phenol liberated in 1 hour. The calculation is carried out in the same way as for alkaline phosphatase. There are normally 1 to 5 arbitrary acid phosphatase units in 100 ml. of serum or plasma.

The colours are somewhat pale in the case of normal blood and in cases of carcinoma of the prostate in which the acid phosphatase is not greatly elevated, and it may be preferable in these instances to use a longer incubation period—e.g., 3 hours. If this is done the weight of phenol liberated (in mg.) is divided by 3 to reduce the figure to 1-hour unitage.

Solutions

Citric Acid-Sodium Citrate Buffer, pH 4.9—21 g. of crystalline citric acid are dissolved in water, 188 ml. of N NaOH added, and the solution made up to 500 ml. The pH should be checked, and adjusted to pH 4.9, if necessary, by dropwise addition of N NaOH or N HCl. This solution should be preserved with a few drops of chloroform and kept in the ice-chest. The other solutions are identical with those described by King *et al.* (1942).

Results

Acid Phosphatase in Plasma.—The values (Table I) for normal controls are somewhat higher than those given by Gutman and Gutman (1938), which range from 0.5 to 2.5 units per 100 ml. This may be explained by the fact that these authors prefer to employ a 3–5 hours' hydrolysis, and obtain a figure for 1 hour's hydrolysis by division.

TABLE I.—*Plasma Acid and Alkaline Phosphatase in Various Clinical Conditions (Average Values)*

	No. of Cases	King-Armstrong Units per 100 ml.*	
		Acid	Alkaline
Normal controls	9	2.8 (1 to 5)	7.3 (3 to 10)
Heart disease	5	3.4 (1 to 5)	7.2 (5 to 12)
Anaemia	4	2.0 (2)	8.8 (5 to 13)
Cholecystitis	2	3.0 (2 to 4)	9.0 (8 to 9)
Catarrhal jaundice and hepatitis	15	3.8 (1 to 5)	16.1 (8 to 31)
Obstructive jaundice	20	3.5 (1 to 5)	56.9 (10 to 163)
Primary carcinoma (stomach)	4	4.0 (2 to 5)	10.3 (6 to 14)
Enlarged prostate	12	3.3 (1 to 5)	6.1 (3 to 9)
Carcinoma of prostate (without bone metastases)	8	3.1 (1 to 6)	8.0 (4 to 11)
" " (with bone metastases) ..	7	11.3 (6 to 19)	42.0 (7 to 87)

* Range in parentheses.

Acid Phosphatase in Seminal Fluid.—The method used was that described, except that the seminal fluid needed to be suitably diluted with normal saline. The results for 12 normal persons are given in Table II, which also includes two esti-

TABLE II.—*Acid Phosphatase of Human Seminal Fluid*

Case	Units per ml.	Case	Units per ml.
1	2,100	8	2,100
2	2,100	9	1,900
3	1,950	10	1,800
4	3,300	11	2,000
5	1,800	12	2,200
6	2,700	Eunuchoid case	24
7	870	"	20

mations on a case of eunuchoidism. They are in good agreement with those of Gutman and Gutman (1941), who reported figures varying from 570 to 3,700 units per ml. in 10 normal specimens. The eunuchoid specimens contained relatively negligible amounts of acid phosphatase. These results are expressed as units per ml., while the plasma results are as units per 100 ml., so that the quantities in the seminal fluid are relatively enormous—i.e., about 100,000 times greater.

Plasma Acid Phosphatase in Cases of Prostatic Carcinoma treated with Stilboestrol.—Table III shows the initial values.

TABLE III.—*Plasma Phosphatases in Cases of Prostatic Carcinoma before Treatment with Stilboestrol*

Case No.	Age	Initial Plasma Phosphatase Value (King-Armstrong Units)		Basis for Diagnosis	Site of Bone Metastases
		Acid	Alkaline		
1	66	12.2	8.9	Section Clinical; x-ray Section	Pelvis and spine
2	58	41.0	15.0		Pelvis
3	72	21.6	24.0		Ribs and pelvis
4	62	5.3			Spine and pelvis
5	70	37.0	25.0		Osteitis deformans in pelvis and spine
6	60	17.0		"	Ribs, spine, pelvis, and femora
7	71	2.0			Osteitis deformans in pelvis and spine
8	37	1.3			Nil
9	77	2.9	5.5	Clinical	Nil
10	61	3.9	10.0		Nil (abnormal opacity ischium)

Six of the cases had a raised acid phosphatase content, and in 5 of these there was radiographic evidence of metastases in bone. Although Case 5 had an initial value of 37 units, we have as yet found no evidence of skeletal metastases, detection of which was made difficult here, as in Case 7, by the presence of osteitis deformans in pelvis and spine.

Several of the results do not show any marked distinction between prostatic carcinoma and Paget's disease. Gutman, Gutman, and Robinson (1940) also found that some cases of advanced Paget's disease had high acid phosphatase values, but in their whole series 26 sera, from a total of 32 cases of Paget's disease, gave normal readings. It is therefore possible that the few results given here are not truly representative of Paget's disease. Gutman considered the possibility that the high acid phosphatase results in Paget's disease were due to

the incomplete inactivation of the alkaline phosphatase at pH 4.9, but excluded this possibility because of the lack of proportionality between the values of the two pH's.

For comparative purposes 3 cases of malignant disease, other than carcinoma of the prostate, are shown in Table IV.

TABLE IV.—*Plasma Phosphatases in Bone Diseases other than Carcinoma of the Prostate with Metastases*

Case No.	Age	Initial Plasma Phosphatase Value (King-Armstrong Units)		Diagnosis	Site of Bone Metastases
		Acid	Alkaline		
1	66	4.3	29.0	Osteitis deformans	—
2	65	1.3	48.0	" "	—
3		8.0	26.0	" "	—
4		11.0	87.0	" "	—
5		5.0	42.0	" "	—
6		2.7	71.0	" "	—
7		5.2	245.0	" "	—
8		2.5	43.0	" "	—
9		4.0	43.0	" "	—
10	65	6.3	34.0	Carcinoma of breast	Ribs and vertebrae
11	68	2.1	23.2	Site of primary uncertain	Pelvis, long bones, vertebrae, and skull
12	32	1.7	10.3		
13	58	1.7	42.0	Osteitis fibrosa cystica	—

The acid phosphatase value of one case of carcinoma of the breast is higher than those recorded by the Gutmans, in which values did not exceed 4.2 units (normal taken as 2.5 units).

The accompanying graphs show the behaviour of the plasma phosphatases during treatment with stilboestrol. The acid phos-

Graphs of cases in which the plasma acid phosphatase was originally raised. —, acid; ---, alkaline.

phatase falls abruptly to a normal value, which is then maintained for considerable periods, with a rise in alkaline phosphatase followed by a gradual fall. In Case 3 the phosphatases were estimated 1 week after stilboestrol therapy began, by which time 35 mg. had been given. No change had then occurred in the acid phosphatase level, but the alkaline phosphatase had begun to rise. The next set of values was obtained 10 days later, by which time 75 mg. of stilboestrol had been given and the characteristic fall in acid phosphatase had taken place.

Intramuscular administration was employed initially to obviate variations in absorption and because it gave an accurate record of the quantity administered. Dosage was very high in the first few cases treated and was reduced in

cases treated later. In spite of high dosage it appears to take an appreciable time for symptoms to improve and for a change in the prostate to be detected. The earliest improvement in back pain occurred on the 5th day of treatment, and no case showed a palpable change in the prostate before the 9th day. A full 6 months elapsed before secondary glandular masses diminished in size in Case 5. Since no case has been studied for more than 18 months (under stilboestrol therapy) it is not possible to say to what extent the dose may be reduced without detriment. There seems to be no advantage, other than that already stated, in giving the drug by intramuscular injection.

Case Records: Carcinoma of Prostate

Case 1.—Aged 66; when first seen in May, 1943, complained of backache of some years' duration and frequency of micturition for 9 months. The general condition was fair, and haemoglobin level and blood picture were normal. The prostate was coarsely nodular, enlarged, and hard, extending laterally, chiefly on the right. Firm lymph nodes were present in both groins. The right lower limb was oedematous. Biopsy of an inguinal node was compatible with a metastatic deposit of prostatic carcinoma. X-ray examination of the pelvis and lumbar spine showed osteoplastic deposits. The initial plasma phosphatase values were: acid phosphatase 12.2 units, alkaline phosphatase 8.9 units. A total of 525 mg. of stilboestrol was given by intramuscular injection in 21 days and thereafter 5 mg. t.i.d. orally. During the first three weeks of treatment a progressive oedema of lower limbs, scrotum, penis, and abdominal wall developed, with an increase of weight of 14 lb. Injections were discontinued, and in two weeks the body weight had decreased by 12 lb., with disappearance of most of the oedema. A palpable shrinking and softening of the prostate was first noticed on the 9th day of treatment, while back pain was almost completely relieved in 1 month. Nocturnal frequency lessened from 3 times to once. The case was last seen in March, 1944, when improvement was maintained, although the x-ray appearances in the bony pelvis showed an increase in the number and size of secondary deposits.

Case 2.—Aged 58; first seen in April, 1943, when he complained of back pain, dysuria, and frequency of micturition for 2 years, with a loss of weight of 2 st. in 6 months. The general condition was poor, with a haemoglobin value of 46%. Blood films showed occasional nucleated red cells. The prostate was hard, irregular, and fixed. No regional lymph nodes were palpable. X-ray examination of the pelvis revealed early osteoplastic deposits. The initial plasma phosphatase values were: acid phosphatase 41 units, alkaline phosphatase 15 units. A total of 828 mg. of stilboestrol was given by intramuscular injection in 5 weeks, and thereafter 5 mg. t.i.d. orally. Back pain was improved on the fifth day and shrinking and softening of the prostate took place in 1 month. Frequency was less in 2½ months. At the end of June, 1943, the haemoglobin level was 64% and the prostate showed a further reduction in size. In Oct., 1943, the haemoglobin was 78%. Improvement in the back pain and in the condition of the prostate was maintained, and the patient returned to his work. He was last seen in March, 1944, when he was still at work and symptom-free, although the plasma acid phosphatase had risen and there had been a progressive increase in the number of bone deposits.

Case 3.—Aged 72; first seen in Oct., 1942, when he had acute retention. Treatment was by suprapubic cystostomy and high-voltage therapy to the prostate, biopsy of which showed an alveolar adenocarcinoma of a high degree of malignancy. Early osteoplastic deposits were present in the ribs. Stilboestrol therapy was begun in June, 1943, when there were no symptoms referable to the prostate. The general condition was very poor, the haemoglobin value being 37%. Suprapubic cystostomy was satisfactory, but the urine was thick and offensive. The initial plasma phosphatase values were: acid phosphatase 21.6 units, alkaline phosphatase 24 units. The prostate was hard and fixed but not greatly enlarged. A total of 75 mg. of stilboestrol was given by intramuscular injection in 19 days and thereafter 5 mg. t.i.d. by mouth. In July, 1943, the patient was readmitted complaining of intense pain in the left calf and shoulder, of sudden onset 2 days before. The temperature was 104° F., the pulse rate 130 a minute. The left calf showed a firm tender swelling, the overlying skin being reddened and hot. The left shoulder was held fixed and was tender to palpation over a wide area. One week later a similar swelling appeared over the left deltoid. The general condition improved gradually and both swellings subsided with symptomatic treatment: they were thought to be embolic in origin. In Nov., 1943, the haemoglobin level was 72% and the general condition was still improving. No alteration was detected either in the size or in the consistency of the prostate. When the patient was last seen in Jan., 1944, the haemoglobin had fallen to 58%. The condition otherwise appeared unchanged.

Case 4.—Aged 62; first attended hospital in May, 1940, for a course of high-voltage therapy after an incomplete prostatectomy, performed elsewhere. Section of the prostate gland showed an

adenocarcinoma. In April, 1942, a firm mass appeared in the abdomen, and a further course of high-voltage therapy was given. At this time the patient complained of back pain, but x-ray examination of spine and pelvis failed to reveal secondary deposits. By Feb., 1943, back pain was constant, and radiographs now showed early osteoplastic deposits in the vertebrae. The general condition was fair, with a normal blood picture. A hard fixed residual mass was present in the prostatic bed. Frequency of micturition was pronounced. The initial acid phosphatase value was 5.3 units. A total of 315 mg. of stilboestrol was given by intramuscular injection in 14 days, and thereafter 5 mg. t.i.d. by mouth. After one month back pain had lessened, and there appeared to be some improvement in diurnal frequency. The local findings remained unchanged throughout. The patient returned to light work, but after 9 months back pain recurred, and x-ray examination of the lumbar spine and pelvis showed the secondary deposits to have increased in number and size in all areas. When last heard of he had been admitted to a local hospital on account of retention of urine.

Case 5.—Aged 70; first seen in Nov., 1942. Suprapubic cystostomy has been performed one month previously on account of acute retention. The general condition was fairly good. Haemoglobin values and blood picture were normal. The prostate was hard and moderately enlarged, with an ill-defined margin on the right. There were firm enlarged lymph nodes in both groins, with oedema of the lower limbs. Biopsy of the prostate showed an adenocarcinoma. X-ray examination of pelvis and spine revealed advanced osteitis deformans but no definite evidence of secondary deposits. The initial phosphatase values were: acid phosphatase 37 units, alkaline phosphatase 25 units. A total of 34 mg. of stilboestrol was given by intramuscular injection in 28 days, and thereafter 1 mg. t.i.d. by mouth. No change was detected in this case for 4 months, when some urine was passed per urethram (for the first time since the beginning of treatment). The prostate was slightly smaller and softer, but the change was not marked. At the end of 6 months the inguinal nodes were smaller. One year after the beginning of treatment this condition was maintained.

Case 6.—Aged 60; when first seen in April, 1941, complained of frequency of micturition. The general condition was good, with haemoglobin level and blood picture normal. Rectal examination showed a prostate of normal size, although possibly firmer than is usual, and with a suggestion of ill-defined borders. X-ray examination of the pelvis suggested secondary deposits. Diagnosis at this time was uncertain. In Sept., 1941, a biopsy of the prostate showed a columnar-cell adenocarcinoma. The plasma acid phosphatase was 17 units. The condition remained stationary for some 18 months under treatment with triphenylchloroethylene (see Haddow *et al.*, 1944), when generalized pain in the chest developed. X-ray examination showed multiple osteoplastic deposits in ribs, spine, pelvis, humeri, and femora. Stilboestrol was first given in March, 1943, in doses of 5 mg. t.i.d. orally. This was later reduced to 10 mg. daily. In 2 months pain in the chest was much less troublesome, and has remained so. The prostate has gradually become softer and smaller, although there is still lack of definition of the right lateral border.

Case 7.—Aged 71; when first seen in Jan., 1943, complained of backache for 4 months and frequency and slowing of the urinary stream for 2 months. The general condition was good. A hard nodular mass continuous with the right lobe of the prostate was detected by rectal examination. A freely mobile firm lymph node was present in the left groin and was excised. Section showed a highly cellular carcinoma, the appearances being consistent with a metastatic deposit from a primary prostatic carcinoma. X-ray examination of the pelvis revealed osteitis deformans but no secondary deposits. The initial acid phosphatase level was 2 units. A total of 117 mg. of stilboestrol was given intramuscularly in 4 weeks. After 2 weeks slight regression of the prostatic tumour was thought to have taken place. Backache had disappeared in 1 month. No further observations could be made, as the patient died at his home 2 months after treatment began.

Case 8.—Aged 37; first seen in Aug., 1942, when he complained of frequency and incontinence of urine for 5 months and intermittent haematuria for 5 weeks. The general condition was fair. The prostate was enlarged and hard. A clinical diagnosis of carcinoma of the prostate was made and a course of high-voltage therapy given in Aug. and Sept., 1942. In Feb., 1943, the patient was readmitted complaining of diarrhoea and anorexia. The general condition was now poor. A large and indurated prostate projected into the rectum, causing partial occlusion and spreading laterally into the pelvis. The lower abdomen was filled by a hard mass. Punch biopsy of the prostate showed a well-differentiated carcinoma. X-ray examination of the pelvis revealed no secondary deposits. The plasma acid phosphatase value was 1.3 units. A total of 450 mg. of stilboestrol was given by intramuscular injection in 4 weeks. Within 12 days there was a slight palpable decrease in the size of the prostate, but apart from this the general condition deteriorated rapidly. The patient died 2 weeks later. Necropsy was not performed.

Case 9.—Aged 77; first seen in Dec., 1942, complaining of frequency of micturition and haematuria. The general condition was good. The prostate was indurated, with extension to the right pelvic wall. X-ray examination of the pelvis showed no abnormality. A course of high-voltage therapy was given in Jan., 1943. By July, 1943, the prostate was still hard and fixed and enlarged to the right. The plasma phosphatase values were: acid phosphatase 2.9 units, alkaline phosphatase 5.5 units. Stilboestrol dipropionate was administered from the end of July, 1943, in doses of 5 mg. daily by mouth. After one month frequency was less, but no change was observed on rectal examination. This was the condition when the patient was last seen in March, 1944.

Case 10.—Aged 61; first seen in Sept., 1942. A suprapubic cystostomy had been performed elsewhere 20 months previously. The general condition was good. On rectal palpation the prostate was found to be enlarged and extremely hard. A clinical diagnosis of carcinoma of the prostate was made, and a course of high-voltage therapy given in Nov. and Dec., 1942. X-ray examination of the pelvis was normal. By Aug., 1943, there was little change in the size and consistency of the prostate. Radiographs showed an abnormal opacity in the left ischium, but plasma phosphatase values were now: acid phosphatase 1.2 units, alkaline phosphatase 8 units. Stilboestrol was given in doses of 5 mg. b.d. orally. On re-examination at monthly intervals the condition remained unchanged.

Discussion of Clinical Results

Palpable changes in the prostate were not produced in all cases. In Cases 1 and 2, in which the original condition was that of an enlarged hard nodular gland, both softening and shrinkage took place, the changes being well marked. The same type of alteration occurred in Cases 5 and 6, but to a less striking degree. No change whatever took place in Case 8—in which the disease rapidly proved fatal—and the findings were equivocal in Case 7. The remaining patients (Cases 3, 4, 9, and 10) had all been treated by high-voltage therapy previously, and in them no definite alteration in the prostate was detected. Hence of the 10 cases only 4 have so far shown definite regression of the primary tumour.

Palpable lymphatic spread was present in 3 of the series (Cases 1, 4, and 5), in each instance with an attendant swelling of the lower limbs. In all three cases a regression of the secondary masses took place, together with a reduction in the oedema.

Metastases to bone, in all 5 cases in which they occurred, were of the osteoplastic type. The appearance of radiographs taken at three-monthly intervals showed in some cases a progressive increase in density, while in others the deposits seemed to become more numerous during treatment, or increased in size.

Pain referable to bone occurred as a symptom in 4 of the series. In 3 cases it was a presenting symptom, while in the fourth it arose after the patient had been attending hospital for 2 years but before there was radiographic evidence of skeletal deposits. It was noted that some amelioration of such pain occurred in hospital with rest alone. Final assessment of the influence of stilboestrol on such pain is therefore best made when the patient returns to his normal routine. These four cases all secured a partial or complete relief from pain, and this has so far been maintained in three of them.

With the exception of Case 8 all showed some measure of betterment in general condition. This revealed itself in an improvement in appetite, a gain in weight, and, in the two cases with severe anaemia, by a gradual increase in haemoglobin. At the onset of treatment the haemoglobin values were 46% in Case 2 and 37% in Case 3. It required between 5 and 6 months for the haemoglobin values to reach 78% and 72% respectively. As each patient was given ferrous sulphate during the earlier period of his treatment the part played by stilboestrol in bringing about this improvement is not known.

Of all the symptoms associated with carcinoma of the prostate, frequency of micturition is likely to be the most uncertain in its response to any form of therapy. Even if a shrinking and softening of the prostate takes place, the extent to which micturition returns to normal must depend finally upon the degree of secondary changes in the bladder. Clearly it is only rarely that these changes will be so slight as to allow of a return to normal function. On the whole there appeared to be some measure of improvement in all the cases in which frequency was a symptom.

Summary

Details are provided of the method employed for estimation of acid phosphatase, and of the values obtained for plasma acid and alkaline phosphatase in various clinical conditions and in normal controls, and for acid phosphatase in seminal fluid. Two specimens of seminal fluid from a case of eunuchoidism contained relatively negligible amounts of acid phosphatase.

Of 10 cases of prostatic carcinoma, 6 showed a raised acid phosphatase content in the plasma: in 5 of these there was radiographic evidence of metastases in bone. Several of the results do not show any marked distinction between prostatic carcinoma with metastases and Paget's disease.

The behaviour of the plasma phosphatases, in cases of carcinoma of the prostate in which the plasma acid phosphatase was originally raised, was followed during treatment with stilboestrol. The response shows a uniformity of pattern, the acid phosphatase falling abruptly to a normal level, which is then maintained for considerable periods, with a rise in alkaline phosphatase followed by a gradual fall.

Of 10 cases of carcinoma of the prostate 4 showed some degree of regression of the primary tumour under treatment with stilboestrol, and secondary deposits in lymph nodes underwent regression in 3 cases. X-ray examination at 3-monthly intervals in those cases with metastasis to bone revealed in some a progressive increase in density, while in others the deposits became more numerous during treatment or increased in size.

With one exception all cases showed some measure of symptomatic and general improvement, in relief from pain, lessening of frequency of micturition, or gradual increase in haemoglobin level, and in improvement in appetite and gain in weight.

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MEDICAL EXPERIENCES IN NORTH AFRICA, 1943-4*

BY

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At the time of El Alamein the hospital sick rates, largely due to infective hepatitis, were at least as high as the battle casualties, and during the Sicilian campaign more men went down with malaria than from enemy action. In my experience at general hospitals in North Africa during almost exactly a year from the Tunisian fighting in March, 1943, till after the Anzio landing in 1944, hepatitis and malaria were again the two most serious medical problems. Bacillary dysentery was on the whole mild, and, though on occasion I had over 300 cases in hospital at a time, most of the men responded at once to sulphaguanidine, and were back on duty very quickly. The average stay in hospital was only ten days.

Infective Hepatitis

Infective hepatitis was at its worst in the autumn months of 1943 and dropped rapidly with the frosts in Jan., 1944. It was a serious problem in the spring among both our own and enemy forces, and I had in hospital a number of German prisoners who had been still fighting while suffering from jaundice. During Oct., Nov., and Dec., 1943, there passed

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