by congenital atrophy of the diaphragm and four cases of *aérogastrie bloquée*. It is remarkable how trivial the symptoms of megacolon may be, the condition often being recognized by the discovery of an enormous gas-containing loop of pelvic colon under the diaphragm in the course of a radiological examination of a patient suffering from nothing more serious than chronic constipation. In a minority of cases recurrent attacks of severe pain from partial volvulus of the dilated pelvic colon occur. Gradual dilatation of the anal sphincter and complete evacuation

FIG. 7.—Woman aged 43. Megacolon showing collection of gas in greatly dilated loop of pelvic colon reaching both domes of the diaphragm.

FIG. 8.—Same case as Fig. 7, after escape of gas under high pressure through tube passed per anum, showing descent of diaphragm from the level of the ninth to that of the eleventh vertebra.

of the colon generally result in complete and permanent relief, although the pelvic colon remains abnormally distensible. In exceptional cases a partial twist of the uppermost part of the pelvic colon prevents the escape of the accumulated gas and painful attacks of partial volvulus may continue. It is sometimes possible to evacuate the air-lock by means of a tube (Figs. 7 and 8). In other cases it may be necessary to excise the volvulus during a quiescent period. I have never found it necessary to advise sympathectomy.

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OUTPUT OF PROLAN A IN URINE IN CERTAIN EXTRAGENITAL CONDITIONS

REPORT OF AN INVESTIGATION

BY

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It is now a well-established fact that in certain tumour conditions of the male and female genital organs the excretion of prolan A in urine is in excess. In the literature the reports in connexion with the relation of prolan excretion to hydatidiform mole and chorionic epithelioma of the uterus on the one hand, and to teratoma and chorionic epithelioma of the testis on the other, are so extensive, and have been so well summarized by Hamburger (1933), that only a few references which bear directly on this investigation will be mentioned. Since Hamburger's publication many workers have found increased prolan A output in the above conditions—for example, Ferguson (1933), Cutler and Owen (1935), and others.

Earlier Investigations

Ferguson carried out numerous quantitative investigations on urinary prolan A excretion in cases of teratomatous testicular tumours, and it is his technique which has been employed in this investigation. He found that 50 to 50,000 mouse units of prolan A per litre of urine were excreted, the amount varying with the embryonal character of the tumour, the extent of the disease, and the status as regards treatment. His work appears to show that the prolan A estimation has a definite clinical value in the diagnosis and prognosis of these cases.

The work recorded in connexion with secondary sex organs and pituitary adenomas is not so extensive as that which has been carried out on the primary sex organs, and the results are not conclusive. In connexion with breast tumours, Engel (1930) and Saphir (1934) investigated a few cases of breast cancer and obtained no positive results. Zondek (1932) and Baudler (1935), however, obtained varying results in patients with similar lesions, some giving a positive and others a negative prolan A reaction. More recently Taylor (1936), dealing with fourteen cases of non-malignant lesions of the breast, found that in three cases of nipple secretion there was a slight increase in the amount of prolan A excreted in the urine. With regard to pituitary tumours Love (1932) reports a case of an adenoma of the pituitary gland in a male which gave a positive Aschheim-Zondek reaction three times as strong as that normally expected in the urine of a pregnant woman. On the other hand, Watts (1932) found no gonadotropic hormone in blood or urine in fourteen cases of pituitary chromophobe and eosinophil adenomas.

I have been unable to discover any record of work on the urinary prolan A content in cases of ordinary prostatic enlargement. The investigations of Burrows (1935), however, appear to have an indirect relation to this subject. He has shown that the effect on the prostate of the mouse of treatment with oestrogenic compounds, which normally are liberated as the result of the action of prolan A, is to produce histological changes resembling in many ways those of benign enlargement in man.

The Present Investigation

The Aschheim-Zondek test is of such generally recognized value in pregnancy and in the somewhat related conditions of chorionic epithelioma and teratoma testis that the paucity of information in this connexion in

lesions of the prostate, and the conflicting results reported in cases of breast lesions, tend to detract somewhat from its value. Under these circumstances further investigations of the urinary prolan A content should, in our opinion, continue to be made on lesions of all types involving either the primary or the secondary sex organs, with a view to clarifying the position. The following investigation is therefore offered as a contribution towards this end. During the period covered by this investigation sixty-six cases from the surgical and gynaecological wards were examined. These, as might be expected, consisted mainly of lesions of the secondary sex organs, though they included a few of the ovary and the testis as well. The cases were distributed thus:

Breast (including carcinoma, sarcoma, duct papilloma, chronic mastitis, cysts, acute and chronic abscesses) ..	28 cases
Prostate (all benign adenomatous enlargement) ..	32 "
Testis (teratoma) ..	2 "
Ovarian cyst ..	1 case
Uterine fibroid ..	1 "
Chorionic epithelioma (see discussion) ..	1 "
Pituitary (eosinophil adenoma) ..	1 "

The method used to determine the amount of prolan A in the urine was that described by Ferguson (1933). The early morning specimen of urine was acidified when necessary and was concentrated by the alcohol-ether method. This concentrated extract was injected into virgin female albino mice not more than 3 weeks old. Three mice were used for each specimen, and received doses of 0.1 c.cm., 0.2 c.cm., and 0.4 c.cm. of the extract respectively. Five injections in all were given to each mouse, two on the morning and evening of the first day, two at the same times on the second day, and one on the morning of the third day. The mice were killed 100 hours after the first injection and their ovaries removed and examined macroscopically at once, and later microscopically. The reaction obtained was judged according to Ferguson's notation (1933):

Reaction I: Hyperaemia and swelling of Graafian follicles with formation of cumulus oophorus.

Reaction II: Massive haemorrhage in ripened follicles.

Reaction III: Corpus luteum formation.

The presence of one or more of these reactions in the sections of the mouse ovaries was considered to denote

Urinary Prolan A Secretion in 66 Consecutive Cases of Lesions of Primary and Secondary Sex Organs

Group	Organ	Lesion	Before Operation		After Operation	
			No. of Cases	Result of A.-Z.	No. of Cases	Result of A.-Z.
A	Breast	Carcinoma	18	All negative	6	All negative
		Sarcoma	1	Negative	—	—
		Duct papilloma	1	"	—	—
		Cystic hyperplasia	2	Both negative	2	Negative
		Acute abscess	1	Reactions II and III in all mice	1	Reactions II and III in all mice
		Chronic mastitis	3	Negative	2	Negative
		Solitary cyst	1	Reaction III in mouse with largest dose	—	—
B	Prostate	Simple enlargement	32	All negative	13	All negative
		Teratoma testis	2	Reaction III in all mice	—	—
C	Primary sex organs	Ovarian cyst	1	Negative	—	—
		Uterine fibroids	1	"	—	—
		? Chorion epithelioma	1	Reactions II and III in all mice	—	21 days later : Negative
		(Same case)	—	—	—	11 months later (before radium): Reactions II and III in all mice
D	Pituitary	(Same case)	—	—	—	1 week after radium : Reaction III in all mice
		Eosinophil adenoma	1	Negative	—	—

a positive reaction. In all sixty-six cases the urine was investigated before operation, and in twenty-five of them the test was repeated ten to fourteen days after operation to see if any change had occurred. The results obtained are tabulated in detail at the foot of the preceding column.

Discussion of Results

Group A: Breast.—Of the twenty-eight cases of varying breast lesions investigated, two unexpectedly gave positive results—namely, "acute abscess" and "tuberculous mastitis." One of these cases was that of a married woman aged 23 who came to the casualty department with an acute abscess in the left breast which had developed on a painful breast of two months' duration following an attack of influenza. The abscess was drained and recovery was uneventful. Examination of the breast at that time produced no evidence of pregnancy enlargement, nor was there any suggestion from her or from the clinicians that she was pregnant. Some months later, however, when she was personally visited it was discovered that she had been delivered of a child six months after the breast abscess had been drained. She must therefore have been three months pregnant at the time the urine was examined, and this obviously explains the positive results obtained both before and after the treatment. The case of tuberculous mastitis occurred in a married woman aged 33 whose youngest child was nine years old. She had had a miscarriage four months before coming to hospital, but stated that since then she had not missed a period. On admission she complained of a painful lump in the left breast that had been increasing in size for the last three months, and of a discharging sore that had been present for four years. Clinically the lump appeared to be malignant, and radical mastectomy was performed. The pathological report, however, showed tuberculous mastitis, but there was no evidence of carcinoma. The positive reaction was given only by the mouse which had received five doses of 0.4 c.cm. concentrated urine, one ovary showing an area of haemorrhage and a corpus luteum, and the other showing the presence of two corpora lutea. This positive reaction cannot be explained unless at the time the patient was pregnant and the pregnancy had a short duration and was terminated without her having been aware of the fact. It is also just possible, since the reaction was given by only one mouse, that this particular mouse was older than had been specified by the dealer, though in size it was similar to the other two used for the test. Apart from these two suggestions I can offer no explanation of the positive reaction in this case. The results obtained in this group of breast lesions were persistently negative, save for one explicable case and one doubtful result.

Group B: Prostate.—All the cases of benign enlargement of the prostate, both before and after operation, gave negative results, indicating that the hypertrophy of the prostate which develops in later life cannot be correlated with that form of pituitary activity which is associated with an increased excretion of prolan, and also that the Aschheim-Zondek test has no diagnostic value in this condition.

Groups C and D: Mixed.—The only case of pituitary adenoma (associated with acromegaly), occurring in a woman aged 32, gave a negative result, which is consistent with the findings of Watts (1932). The two cases of teratoma testis were both positive, and fall into line with the findings of other observers (for example, Ferguson, 1933). The other positive case in this group was that of a woman aged 25 who complained of a blood-stained

discharge for three months following a miscarriage. On examination the uterus was found to be soft and uniformly enlarged to one and a half inches below the umbilicus. No foetal parts were felt per vaginam. The breasts were active, and the diagnosis of a normal pregnancy was made and she was discharged. Two months later she returned, having had a "flooding" ten days previously, when she passed clots and some "white tufts." At this time the uterus was not palpable per abdomen, but was found to be enlarged per vaginam (two to three months). The breasts were still active. A positive Aschheim-Zondek reaction was obtained. As the discharge continued over a period of three weeks it was decided to perform a curettage. The curettings, however, showed only blood clot and fragments of normal-looking endometrium. There were no chorionic villi or other products of conception, and no evidence of hydatidiform mole or chorionic epithelioma. All these observations have been confirmed by subsequent examination of the curettings. Three weeks later the Aschheim-Zondek test was negative. Quite recently, eleven months after the curettage, this patient returned to hospital with a large mass in the uterus which had extended into the vagina. Clinically the mass was diagnosed as a chorionic epithelioma, and a positive Aschheim-Zondek reaction was obtained. She was treated with radium, and a week later the test was repeated and was found to be still strongly positive. She died a day after the last test, and at the post-mortem examination a large mass of growth was found in the uterus and vagina, with metastatic nodules in the lungs. Microscopically the tumour was a typical chorionic epithelioma. The case is included in this series because of the interesting sequence of events. It is obvious that in the beginning a normal pregnancy was present; hence the positive reaction. The pregnancy terminated in an abortion, which explains the curettage findings and the negative test. Some residual chorionic tissue must have been present, since a chorionic epithelioma later developed, but at that stage it was not sufficient to give a positive Aschheim-Zondek reaction.

Summary

The results of Aschheim-Zondek tests on urines from patients with diseases of the secondary sex organs show that, with one possible exception, lesions of the breast and prostate are not associated with any increase in prolan A excretion in the urine. Among additional cases examined the positive results obtained with chorionic epithelioma, teratoma testis (two cases), and an unsuspected case of pregnancy confirm previous findings in these conditions, and the negative results in cases of ovarian cyst, uterine fibroids, and pituitary eosinophil adenoma are in keeping with the majority of previous observations.

I should like to record my thanks to Dr. Fraser and Dr. Taylor and the clinical staffs of the Bristol Royal Infirmary and the Bristol General Hospital for collecting the material for this investigation. The expenses of the work were defrayed by a grant from the Colston Research Committee.

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LABYRINTHINE GIDDINESS ITS NATURE AND TREATMENT

BY

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Giddiness is a vague term, and includes a very large number of conditions in which the patient either feels unsteady or is unsteady on movement. I propose to confine myself to cases in which such unsteadiness is due to a derangement of the internal ear or labyrinth, partly because this is a very common type and partly because it is the only one about which I can speak with any degree of confidence.

Some Anatomical and Physiological Points

The first problem presenting itself is to decide whether the giddiness is labyrinthine or not, and it might help if I first briefly run over some anatomical and physiological points in relation to the internal ear, as helping to clarify the picture. The internal ear consists of a very delicate perceptive nerve apparatus enclosed in a series of intercommunicating fine membranous tubes and small chambers filled with fluid (the endolymph), surrounded by fluid (the perilymph), and suspended in a dense bony capsule. The anterior portion of the membranous labyrinth we know as the cochlea, and its function is confined to hearing. It is, I think, now established that the perception of different tones is a function of the cochlea, and the analogy of a piano or other stringed instrument, each string being associated with a different tone, is near enough to the truth for our purpose. The posterior portion of the membranous labyrinth consists of the semicircular canals and otolith organs, which together constitute the vestibular apparatus. The function of this apparatus is to assist in the co-ordination of movement by informing the centres of the position or movement of the head in space. While the semicircular canals take note of turning movements, the otolith organs probably appreciate movements in a horizontal or vertical plane.

From a physiological point of view both the auditory and the vestibular organs are extremely sensitive, but while the stimulation of the auditory organ is recognized by our consciousness, normal stimulation of the vestibular organ is not. Our own experience, however, in crossing the Channel, ascending in an aeroplane, or, if we belong to the Victorian era, waltzing in the old style, teaches us that a relatively moderate degree of excess of normal stimulation will both impress our consciousness and produce a widespread disturbance of the vegetative nervous system as shown by nausea, vomiting, pallor, sweating, etc. Fortunately, however, this organ, although extremely sensitive, is adaptable, with the result that Nelson was able to win battles at sea and Miss Colledge is able to spin on skates at an incredible speed and stop instantaneously without feeling any discomfort.

While from the examples I have given we appreciate that giddiness results from overstimulation of the vestibular apparatus, it may also occur as a result of the unbalanced action of the two sides. Thus if the labyrinth be destroyed on one side, for a time the individual is incoördinate and therefore giddy; but experience shows that in the course of a few weeks or months this also is allowed for, and both the unsteadiness in movement and the subjective giddiness pass off, the individual becoming normal, at any rate for the ordinary movements of everyday life.