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AN EXAMINATION OF THE FIELDS OF VISION IN THE LAST WEEKS OF PREGNANCY

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DURING the past few years several investigations have been made regarding the occurrence of bitemporal contraction of the fields of vision associated with pregnancy, with a great discrepancy in results. This variation of opinion led me to examine a series of cases during the last weeks of pregnancy the findings in which are the subject of this thesis.

The position of the optic chiasma was said to be on the optic groove of the sphenoid bone. This statement in recent years has been questioned and is now regarded as being wholly incorrect. Many workers, including Traquair⁽¹⁾, Herbert Fisher⁽²⁾, etc., have studied the anatomical relations of these parts and have come to the conclusion that the chiasma lies much further back.

Dr. J. Parsons Schaeffer⁽³⁾ examined 125 freshly exposed brains and showed that only in 5 of the cases examined did the optic chiasma lie in intimate relationship with the chiasmatic sulcus. "In 96 per cent. the optic chiasma lay wholly or partly over the diaphragma sellae and the underlying hypophysis; and in 79 per cent. of these instances the anterior, and often the greater part of the chiasma, had the diaphragma-hypophyseal relation, the dorsal and the lesser part projecting variously over and behind

the dorsum sellae; in 12 per cent. the entire chiasma lay over the diaphragma and the subjacent hypophysis, and in 5 per cent. the dorsal part of the chiasma rested over the diaphragma, the anterior part resting upon the chiasmatic sulcus; in 4 per cent. of the bodies the entire optic chiasma was behind the diaphragma sellae, lying on the dorsum sellae and projecting behind it."

Fisher says the "optic chiasma does not lie in the very shallow groove on the sphenoid bone." Traquair states: "thus the chiasma lies well behind and above the usually described position, its posterior edge projects behind the level of the dorsum sellae to an average of 1.58 mm." (Zander⁽⁴⁾).

Wallis⁽⁵⁾ examined 11 subjects and in only one did the chiasma lie in the usually described position. He found it usually lay over the diaphragma and partly on the dorsum sellae; he states that whilst the chiasma does occasionally lie in the sulcus chiasmatis it is nearly always completely posterior to this groove.

The dimensions of the optic chiasma vary in different subjects, the width is generally given as about 12 mm., the antero-posterior diameter, according to Zander is 8 mm., while the depth is usually given as 4 mm.

It is evident that the optic chiasma can be affected by any enlargement of the pituitary gland which is sufficiently great to press on the chiasma and so interfere with its function.

The diaphragma sellae and the basal surface of the optic chiasma may actually be in contact with each other, or may be separated by an interval of as much as 10 mm. Traquair gives the measurement of the interval as 4 mm. Owing to the fact that the back of the chiasma is on a slightly higher level this interval increases from before backwards.

In the centre of the diaphragma there is an opening through which passes the posterior part of the infundibulum. The diaphragma is, in a large proportion of cases, a dense strong membrane forming a complete roof over the hypophysis, except for a small foramen. This opening varies greatly in size, in some cases it may be very small, while in others it may be so large that "the diaphragma itself is reduced to a mere rim" (Traquair). "The greater portion of the diaphragma was in some instances found to be more or less fenestrated, and of frail build" (Schaeffer). Fisher says: "the diaphragma sellae is a very variable membrane." Thus a greater compression of the chiasma would take place in cases of hypertrophy of the pituitary gland associated with a poorly-developed diaphragma sellae, than would occur with a well-developed diaphragma.

The infundibulum "passes over the dorsum sellae in a forward and downward direction; immediately beyond its commencement it is in contact with the centre of the lower and posterior surface

of the chiasma"; thus it is shown that "it is the infundibulum, and not the hypophysis, which is in immediate contact with the chiasma, and it can also be shown that a thickened and congested infundibulum, or an infundibular tumour pressed upwards by a subjacent hypophyseal enlargement would impinge directly upon the mid-line of the under-surface of the chiasma, and so might exert a longitudinal pressure at a comparatively early stage" (Traquair).

The pituitary body varies considerably both in weight and dimensions, even under normal conditions (Rasmussen⁽⁶⁾). The average dimensions are 9 mm. antero-posteriorly, 6 mm. vertically, and 13 mm. transversely. The weight in males is 0.5 grm. and a little more in females, tall individuals have proportionally larger glands (Rasmussen). As regards age the gland is found to increase up to 45 years, after which it gradually decreases (Sharpey-Schafer⁽⁷⁾).

"The pituitary is divided into two lobes by a cleft, a larger anterior and a smaller posterior; the anterior lobe is glandular and very vascular, while the posterior lobe is made up of neuroglial fibres with glial cells scattered amongst them; there are no true nerve cells and few vessels" (Sharpey-Schafer).

That the pituitary gland enlarges during pregnancy is a fact that is now generally recognized. Swale-Vincent⁽⁸⁾ states that "in pregnancy the pituitary may become hypertrophied to two or three times its normal size. The increase consists entirely in the glandular portions, *i.e.*, the anterior lobe. The pituitary during pregnancy resembles an epithelial tumour. The increase in the amount of secretion is seen by the fact that one can squeeze a milky juice out of the gland. This hypertrophy persists to a certain degree, even after pregnancy, so that the size of the gland in a multipara may be three times as great as that of the normal gland." Sharpey-Schafer also states that the gland becomes partly enlarged during pregnancy, and also that the gland is distinctly larger in females who have borne children than in nulliparae. Bandler⁽⁹⁾ says that "the gland never goes back to its former ante-pregnant state." Various other authorities, including Comte⁽¹⁰⁾, Launois⁽¹¹⁾, Mayer⁽¹²⁾, Centili⁽¹³⁾, Fisher⁽¹⁴⁾, agree that the pituitary enlarges during pregnancy.

Sharpey-Schafer states that "the cells of the pars anterior are of two kinds: (a) clear and non-stainable (chromaphobe, often termed chief cells); (b) granular and stainable (chromaphil). These latter chromaphil cells are divisible into (1) those the granules of which stain with acid dyes (oxyphil, also termed eosinophil); and (2) those the granules of which stain with basic stains (basophil). Oxyphil cells are normally by far the more numerous. During pregnancy large granular or fibrillated oxyphil cells are observed

forming masses within the pars anterior which is always enlarged. [By some authorities these are described as enlarged chromaphobe cells which have acquired oxyphil characters (see Comte, *Ziegler's Beiträge* 23, 1898, and Launois et Mulon, *Comp. rend. de l'Assoc. des Anatomistes*, Liège, 1903).] They have been called "pregnancy cells." Sharpey-Schafer thinks they are modifications of the ordinary oxyphil cells. He states that "after parturition they become smaller and also lose their specific appearance, but oxyphil cells always remain in larger numbers." Beckerhaus⁽¹⁵⁾ states that the pituitary enlarges during pregnancy and that the increase is in the number of "Hauptzellen," and at the end of pregnancy they number 80 per cent. of the total cells. These have also been called the "pregnancy cells" (*Schwangerschaftszellen*); it would be seen that Beckerhaus leans towards the opinion that these pregnancy cells are enlarged chromaphobe cells which have acquired oxyphil characters. Erdheim and Stumme⁽¹⁶⁾ examined microscopically 25 cases and found that the eosinophil or oxyphil cells are always the predominating cells, next numerous are the basophil; the "Hauptzellen," or chromaphobes, are scarce in nulliparae and men.

A further 150 cases were then examined by Erdheim and Stumme and as many cases as possible were collected of pituitary glands, where death had occurred during delivery or a few days after, so as to obtain a gland before the "involution stage" had set in. The gland was found to be considerably enlarged macroscopically, and projecting out of the sella Turcica, but it was only the anterior lobe that was found to take part in this enlargement. Histologically, the chromaphobes, or "Hauptzellen" were considerably increased, they were also enlarged and became the "*Schwangerschaftszellen*," or pregnancy cells. A few weeks after the birth of the child the eosinophils again predominated. Involution took place rapidly, but histologically the pituitary remains altered for many years after one pregnancy. It has already been shown that the pituitary enlarges during pregnancy and that it reaches a maximum growth just before the termination of the pregnancy. The increase in size is generally taken as anything from two to three times its volume, and the weight of the pituitary in various subjects is shown below; the weights are those given by Erdheim and Stumme and the number of cases examined was 150.

Average weight of hypophysis in nulliparae=61.8; max. 75 cg.
 Average weight of hypophysis in primiparae=84.7; max. 110 cg.
 Average weight of hypophysis in multiparae=106; max. 165 cg.

Thus it has been clearly shown that the pituitary in pregnancy increases both in volume and weight. That the optic chiasma and

the pituitary have a very close relationship is a fact that has been clearly stated earlier in this paper, and from our clinical experience we know that tumours of the pituitary produce defects in the fields of vision. This fact suggested to various observers that in pregnancy the fields of vision might be affected by pressure on the chiasma by the enlarged pituitary gland.

It is evident that the amount of bitemporal contraction depends on :

- (1) The amount of hypertrophy of the pituitary gland.
- (2) The amount of compression of the chiasma.
- (3) Anatomical peculiarities of the chiasma, sella Turcica, and diaphragma sellae.

Observers showed a great deal of discrepancy in their results. The results of a few of these observers are as follows : Finlay⁽¹⁷⁾ of Cuba examined 31 cases of which only 9 could be considered approximately normal, the remainder showing changes in the nature of a bitemporal contraction; of these 8 were slight, 9 moderate, 5 pronounced. The methods of his examination are not given in this thesis. Dr. Maud Carvill⁽¹⁸⁾ of Boston, Mass. examined the fields of 67 gravid women, the progress of whose pregnancies was otherwise normal, *i.e.*, there were no complications, their blood pressures, urines, and general health were considered normal. Their fundi were normal, and their vision was of normal acuity. Dr. Carvill says : "the definiteness of the delineation of the fields has impressed us. In many cases the variation of a degree in the position of the test objects was a definite question of seeing it or not seeing it." The fields were taken by daylight with a perimeter with a radius of 28 cm., using a 5 mm. opaque white test object. Dr. Carvill's results were as follows : 61 cases were examined during the last month of pregnancy, only 7, or 11 per cent. were considered normal; the remaining 54, or 89 per cent. showed bitemporal contraction of a greater or less extent; 16 cases, or 28 per cent. showed a marked contraction (20° or more); 12 cases, or 20 per cent. showed moderate contraction (10° to 20°); 26 cases, or 42 per cent. showed slight contraction. Dr. Carvill says that the work of Erdheim and Stumme proves the question of functional hypertrophy beyond the stage of conjecture. After parturition there occurs a subsidence, involution being complete at the end of lactation; with each succeeding pregnancy a further augmentation takes place. The women examined by Dr. Carvill were all of good intelligence and 5° was regarded as the minimum for a definite contraction. Dr. Alexander Fewell⁽¹⁹⁾ states "13 gravid women were selected in the order of their admission to the maternity department of the

School of Medicine of the University of Pennsylvania, all of them were normal in all other respects and none of them exhibited any abnormality or disease of the fundus oculi. All were approaching the termination of their pregnancy, *i.e.*, in the ninth month. Six of the women were primiparae, one in her second pregnancy, one in her fourth, two in their sixth, one in her ninth, and one in her tenth. (Dr. Fewell mentions 13 cases, but only accounts for 12 of them.) All the fields were taken with white test objects, 5 mm. and 3 mm. (colours yielded no additional information) with daylight exposure. Where contraction of the fields was found with these tests they were also and similarly contracted when investigated with large white test objects, *i.e.*, 15 mm. Following for comparison the "Lancaster-Carvill rule" fields contracted for 5° or less were considered to be normal. Dr. Fewell found that in only two cases were the fields normal in extent, and in one so slightly altered (only a slight contraction slope in the upper outer quadrant) that the fields were practically normal. (Two of the women were in their first pregnancy, and one in her ninth.) In 9 cases there was definite contraction on the temporal side of the field, *i.e.*, from 15° to 40° ; three of these cases showed a slight nasal contraction, but in no instance (5 mm. test) more than 15° ; in one case there was a temporal slope in one field and an upper temporal indentation in another. In seven of the charts the reactions to the 5 mm. and 3 mm. test objects were identical, or practically so; in the other five the fields charted with the 3 mm. test objects were smaller than those with the 5 mm. test objects, but practically identical in shape, and in only one case was there a decided difference. In no instance was it possible to find a complete bitemporal hemianopia, and in none was there the slightest sign of a scotoma in the caeco-central, or para-central areas; also there were no alterations in the size of the blind spot, and no changes in the area above it. The restoration of the visual field boundaries, in all cases tested to determine this point, was evident after the termination of pregnancy.

W. Lohlein⁽²⁰⁾ says that bitemporal hemianopia is very constant and can be demonstrated in 78 per cent. of all pregnant women towards the end of pregnancy. At first Lohlein met with disappointing results as he examined in the eighth and ninth months, later the fields were examined two to three days ante-partum; in two cases he examined on the day of labour. He says that, if pregnant women are examined in the last two months, in the majority this phenomenon is quite obvious, starting four weeks ante-partum and reaching the maximum at the time of labour. The contraction for colours (red and green) is always observed first and disappears about ten days after birth, but remains a little longer in multiparae. Lohlein says that the increase in volume is

chiefly from above downwards, *i.e.*, the pressure is on the posterior angle of the optic chiasma. This coincides with his field of vision findings. Lohlein actually shows a graph giving the relation of this phenomenon to the days preceding birth, and just after. It is constructed from several observations and represents an average. In this graph Lohlein shows that the amount of contraction of the field of vision is greatest 36 hours before the birth of the child, and that so rapid is the subsidence of the pituitary gland that at the end of twelve hours after birth the amount of pressure on the chiasma is so reduced that contraction of the field is the same as that of seven days after parturition. J. Igersheimer⁽²¹⁾ examined 12 cases in the last months of pregnancy and came to the conclusion that a "very constant bitemporal hemianopia occurs." Bellinzona and Tridonani⁽²²⁾, also Forti⁽²³⁾ recorded changes in the visual fields of a similar nature which they attributed to dynamic or vaso-motor disturbances similar to those occurring in hysteria. This was quoted by Finlay at the proceedings of the International Congress of Ophthalmology, Washington. Erdheim and Stumme quote one case of bitemporal hemianopia (Reuss. Sehnervenleiden in Folge von Graviditaet: *Wien. Klin. Wochenschr.*, p. 1116, 1908), but they think that this must be exceptional. Traquair⁽²⁴⁾ thinks "the so-called bitemporal contraction in pregnancy is also functional." Fisher⁽²⁵⁾ quotes a case as follows: "A woman who had suffered from double papillitis and symptoms of vomiting which may probably have been of cerebral origin associated with pregnancy, had severe headaches coming on a few weeks after the onset of pregnancy, which were accompanied by paralysis of the left external rectus muscle, the pain disappearing after confinement. A few weeks after again becoming pregnant the headaches returned as before; this pregnancy terminated at three months spontaneously. The sixth nerve paralysis persisted on the left side and she developed a partial, but quite definite, hemianopia indicative of pressure on the left optic tract. The hypophysis is known to be larger in a woman who has borne children than in a nullipara. The explanation in this case seems to me to be that the enlargement of the pituitary body associated with pregnancy exceeded the limits of the normal, and sufficiently so to cause pathological increase of intra-cranial pressure in two successive pregnancies; the enlargement extended particularly to the left side of the sella Turcica and thus involved the left sixth nerve in the floor of the cavernous sinus groove, and to some extent the left optic tract." The X-ray picture of this patient's skull showed a rather deeper sella Turcica than normal, and the anterior and posterior clinoid processes were rather closer together. Fisher says that "in such a fossa any unusual and rapid swelling of the pituitary body would probably find its path of least resistance to be

in the lateral directions, and in this case the swelling expanded particularly to the left side." E. Holn⁽²⁶⁾, who confirmed Finlay and Carvill's findings, after seeing Lohlein's article, made independent investigations; he thought that the enlargement of the pituitary was for the purpose of preparing for uterine contraction during labour, and he tried to find a relationship between the severity of the pains and the size of the pituitary gland, as shown by visual disturbance. He got no results. Forty-five fields of vision were tested, 36 of which were in the last month, both white and coloured objects were used, especially blue, red, green, and yellow; only one case showed anything at all, in this the field examined with the 5 mm. white test object was constricted bitemporally and in this case labour was prolonged, *i.e.*, the uterine contractions were weak and pituitrine had to be given to terminate the confinement. Even here Holn is doubtful of the result being functional and due to fatigue. All his other 44 cases were normal. Dr. Leni Schoninger⁽²⁷⁾ examined 24 cases, several of them 7, 5, and 2 days before parturition. He did not obtain a single positive result, and thought that fatigue played a rôle, also suggestion. One case which showed apparently a result lay down and rested for half an hour; the patient, after resting, gave a normal field of vision. Beckerhaus examined 150 cases among which there were a few abnormal findings, most of which Beckerhaus was able to explain by functional conditions, or they were within physiological limitations; his actual findings were that one case had slight limitations of the fields of vision and sense of light in both eyes. His second case showed slight unilateral temporal limitation for colours only, not for white.

During the past twelve months I have examined the fields of vision, etc., of 70 pregnant women at the ante-natal clinic of the Leicester Maternity Hospital. All the patients who were seen by me were calculated to be in the last month of their pregnancy. The two extreme cases were, one patient was examined 43 days before her confinement, whilst another was examined one day prior to her confinement, the average of the total number of days previous to parturition was 15.9 days. The majority of the women belonged to the labouring class and a large proportion of them had been themselves working during part of their pregnancy. The cases were in no way specially picked; they were just taken in the order in which they presented themselves at the clinic. A number of those attending the clinic, refused to be examined, while others refused in the course of their examination to proceed with it. The patients were of varying ages, the oldest being aged 43 years, while there were two patients aged 17 years. The number of the

pregnancies varied, the greatest being that of one patient who was pregnant for the seventh time. Of the seventy patients, 43 were pregnant for the first time, 15 for the second, 5 for the third, 4 for the fourth, 2 for the fifth, and one for the seventh. A few patients were rejected for various causes, such as corneal ulceration, convergent strabismus, divergent strabismus, iridodonesis following an injury to the eye many years previously. One patient was found to be colour blind.

The urines, etc., were examined, and in those cases in which albumen was found the blood pressure was taken and is shown in the appendix. The fundi of all the patients were examined and all found to be normal except in the case of Mrs. D.D. No. 36, who had developmental defect of the right disc. The visual acuity of all the patients was taken and in cases where the vision was not 6/6 the pupils were dilated with homatropine and cocaine, a retinoscopy was done, and the cause of the diminished visual acuity was ascertained.

Only three patients complained of any alteration in vision during pregnancy, one had a large error of muscle balance, while the other two had large amounts of hypermetropic astigmatism; one of these latter patients actually said that during the past two months she thought she "was going blind." This patient's vision was: right eye 6/36, left eye 6/12. I found she had 4.5 dioptries of hypermetropic astigmatism in the right eye, and 1.0. diopetre of hypermetropia combined with 1.5 dioptries of hypermetropic astigmatism in the left eye. She had never previously worn glasses; her vision when wearing her correction was: right eye 6/12, left eye 6/6; this patient's age was 25 years, and this was her first pregnancy. I expect that she had always managed to do her work until the strain of pregnancy upset her accommodation.

None of the 70 patients complained of "seeing through a blue mist"; even when asked a direct question none of the replies was in the affirmative. "Patients with rapidly growing pituitary growths have described to me the symptom of "seeing through a blue mist" (Fisher), and such experiences are recorded by other observers.

The visual fields were taken with a Rayner perimeter of 32 cm. radius, and in daylight, except where otherwise stated, and with varying sizes of test objects. In all cases the test objects were moved from without in.

I divided my cases into three groups:

(a) This group was examined with a 10 mm. object. The cases were examined with white and three colours, *i.e.*, blue, red, and green.

(b) The fields of vision in this group were examined with a 5 mm. test object, and were also examined for a colour scotoma.

It has been suggested by E. Fuchs, according to Traquair, that scotomata or scotomatous types of fields might be due to toxins secreted by a neoplastic hypophysis. Parsons⁽²⁸⁾ quotes Nettleship as stating that in enlargement of the pituitary body "the earliest visual symptom is unilateral colour scotoma." Bishop Harman⁽²⁹⁾ states: "the failure of colour sensibility is an early sign of defect of the optic nerve."

(c) The fields of vision in this group were examined with a 2 mm. test object; and this group was also examined for a central scotoma or a scotoma in the temporal field.

In Group (a) the fields of 20 patients were examined with a 10 mm. object for contraction of white, blue, red, and green fields. Sixteen of these patients were pregnant for the first time, the other four were second pregnancies. All the patients were examined in daylight, except No. 14, Mrs. M.S., who was examined in artificial light. Twenty patients were examined, *i.e.*, 160 fields of vision; only two patients out of this number showed anything abnormal in the nature of a temporal contraction.

(1) Mrs. W.B. No. 9, aged 20 years, first pregnancy. This patient, before the examination commenced, volunteered the statement that "the left eye had always been defective," yet her vision right and left was 6/6. I was unable to find any cause in the fundi for either her statement or the contraction, the only abnormality found on examination being a large error in her muscle balance; the amount of contraction was 10° temporally for white only in the left field. The contraction extended from the angle 105° to the angle 135° . Her remaining seven fields were normal.

(2) Mrs. L.B. No. 18. The whole of this patient's fields were normal, except the right field for blue. The amount of contraction was only 10° and extended from the angle 90° to the angle 150° . This patient was extremely nervous and I feel sure that if an opportunity had presented itself of doing this field again it would have shown the normal limitation.

Since only two fields out of 160 fields of vision showed any change at all, and the amount of that very slight indeed, with a probable reason for each contraction, and also since the amount of that contraction was quite within the bounds of the physiological, I think it may be assumed *that the fields of these 20 patients were all normal.*

Group (b) consisted of 30 patients whose fields of vision for white were examined with a 5 mm. test object, all of whom were also examined for a colour scotoma. *These 60 fields were all normal, no contraction being present.* No scotomata were found, but one patient, Mrs. D.D. No. 36, was rather uncertain of the colours with the left eye. I was unable, however, to mark out any

definite scotomata. In the right eye no scotomata were found. One patient in this group, Mrs. E.G., was colour blind.

One patient, Mrs. E.S. No. 21, was examined in artificial light, all the others were examined in daylight. Thus we see all the patients in group (b) gave negative results.

Group (c) was composed of 20 patients whose fields I examined with a 2 mm. white test object, making in all 40 fields of vision. Of these, 13 patients gave absolutely normal fields; seven were examined in artificial light, the remaining six with daylight. Of the remaining seven patients who showed contraction four had one field only contracted :

(1) Mrs. F.A. No. 51, right field normal, left field temporal contraction, amount 7° from angle 80° to angle 145° .

(2) Mrs. K.A. No. 52, right field normal, left field temporal contraction, amount 15° from angle 105° to angle 135° .

(3) Mrs. H.S. No. 53, right field normal, left field temporal contraction, amount 7° from angle 65° to angle 145° .

All these three patients were examined in daylight.

(4) Mrs. M.F. No. 66, right field was examined first and was normal; while the left field, which showed 10° of temporal contraction, was being examined, patient complained of being fatigued and was obviously tired. In addition she had a small amount of albuminuria and her blood pressure was 115/75.

Of the three remaining patients the first two were examined in artificial light.

(5) Mrs. H.O. No. 59. This patient showed 10° of contraction of the lower temporal field of the right eye. She also showed contraction of the same amount of her nasal field. Her left field showed concentric contraction, varying in amount from 15° to 5° . This patient had advanced tuberculosis of the lungs. Her general mentality was poor. Owing to her delicate health in childhood this patient had never been to school and was illiterate.

(6) Mrs. M.S. No. 62, showed 5° of temporal contraction in both fields. This patient's right vision was 6/36 and left vision was 6/12. She had a large error of refraction uncorrected. Right eye: 4.50 dioptries of hypermetropic astigmatism, and left eye: 1.50 dioptries of hypermetropic astigmatism combined with 1 dioptre of hypermetropia. Her vision with correction was R.E. 6/12 and L.E. 6/6. The fields were examined while the patient was not wearing her correction.

(7) The third patient showing bitemporal contraction was Mrs. F.D. No. 67. She was examined in artificial light and showed right eye 5° of contraction from angle 120° to angle 140° , and left eye 5° of contraction from angle 90° to angle 140° ; the amount

of this contraction was very small and patient had some albuminuria; her blood pressure was 135/80.

Taking into account the smallness of the test object thirteen out of twenty patients were absolutely normal, and only three out of twenty showed an amount of bitemporal contraction which was within the limits of physiological contraction, also two of these patients showed a perfectly good reason for this contraction, *i.e.*, Mrs. H.O. No. 59, general poor mentality and development, and Mrs. M.S. No. 62, large uncorrected error of astigmatism, while the third patient, Mrs. F.D. No. 67 had albuminuria. I have thus shown that in the seventy patients examined only three showed bitemporal contraction, and the amount of this was very small, the size of the object being 2 mm., and these three patients all had some other disturbance of their condition apart from pregnancy.

I think we can assume from these figures, and from those given by Beckerhaus who examined 150 cases, that bitemporal contraction of the fields of vision in pregnancy does not occur.

It is perhaps surprising to note that the bitemporal hemianopia has been stated to be symmetrical. This could only be accounted for by an absolutely central and almost knife-edge protrusion of the enlarged gland. The possibility of such an occurrence appears to me to be very difficult to believe.

In view of the rarity of observers in Europe finding contraction of the fields as compared with the frequency of positive results in America, it might be well to ascertain the following points:

(1) If some racial peculiarity of skull formation or pituitary development or; (2) if retinal fatigue; or (3) even suggestion could account for this diversity of results by skilled observers.

In conclusion I wish to thank Mr. Lewis Lilley by whose kindness I was permitted to examine these patients. I also wish to thank Mr. J. A. Keen for his valuable suggestions.

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UNILATERAL CHRONIC ANTERIOR UVEITIS IN CHILDREN. A CLINICAL NOTE

BY

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STIRLING

FROM the standpoint of clinical observation and research the post of oculist to a large education authority has certain advantages and certain drawbacks. The principal advantage is that one sees a large number of young people who may show the beginnings of disease which otherwise might go unnoticed. Parents will bring a child when they have been definitely notified by the School Inspection Staff that the eyesight of the child is defective, although of their own initiative they would not seek advice: such failure to seek advice is either because they are unaware of the defect or do not think it important. The principal drawbacks are two in number. The first is that while one may see the beginnings of disease there is usually no opportunity to see the end, since the child may and probably will be lost sight of on