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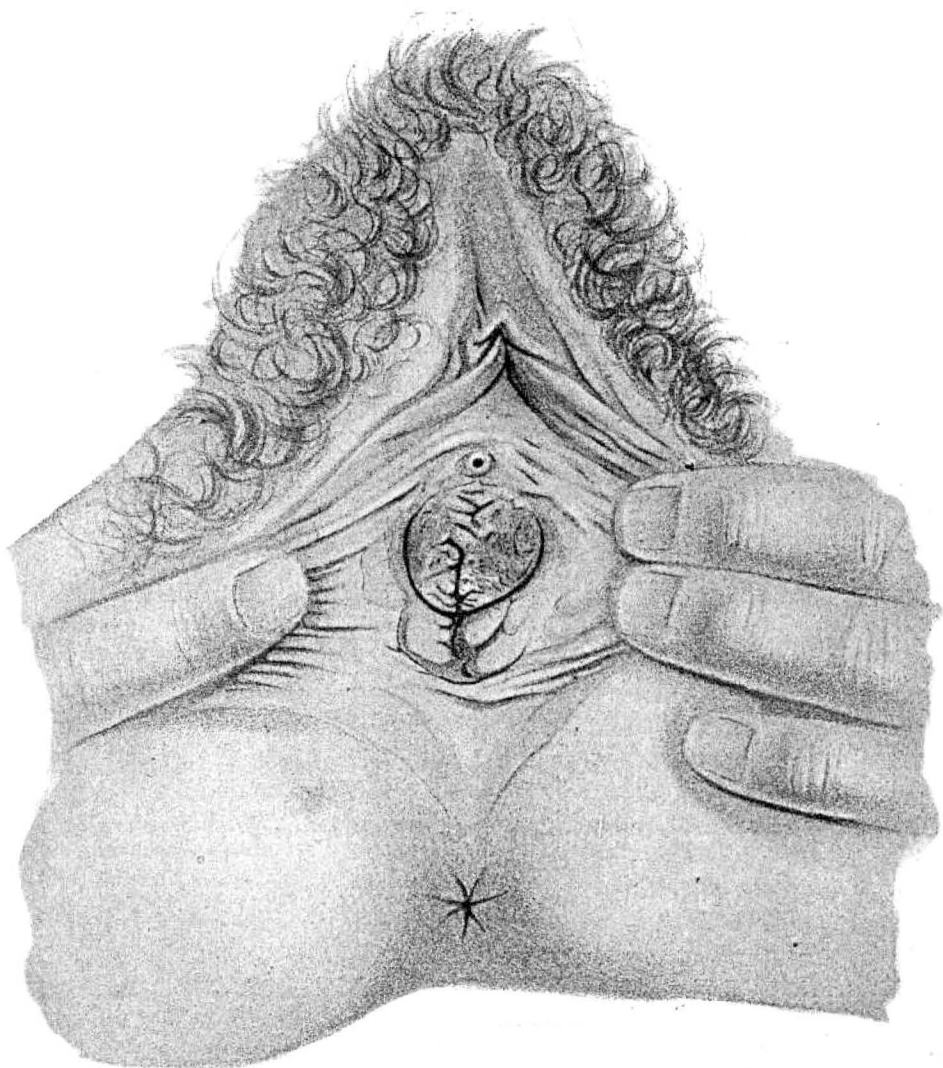
THE VALUE OF THE BLUISH COLORATION OF
THE VAGINAL ENTRANCE AS A
SIGN OF PREGNANCY.

BY JAMES R. CHADWICK, M. D.,

Boston.

My attention was first forcibly drawn to this phenomenon by a paragraph in a review of the first edition of Playfair's *Treatise on the Science and Practise of Midwifery*, that appeared in the *Medical Times and Gazette* of August 26, 1876. It was as follows: "The violet color of the vagina, pointed out by Jacquemier and Kluge, he thinks valueless, on the ground that it is constantly seen when similar pressure is effected by large fibroid tumors of the uterus. Now, many obstetricians of repute attach great weight to this sign, and it certainly is not produced by all fibroid tumors of the uterus large enough to simulate the gravid uterus. We do not wish to question Dr. Playfair's very emphatic statement, but it is a very important one, and we think that a full account of the circumstances under which this violet color is met with, associated with fibroids, or any other conditions, would be of service; although, of course, it is not called for in a work like the present."

My hastily formed determination to investigate clinically the value of this sign was fortified by the great diversity of opinion among obstetricians which I discovered on ransacking our literature of the subject. The first mention of it is uni-



original plate was in color

This plate shows what is described in the text as the "characteristic" bluish tinge of pregnancy. The change of color is confined to the anterior wall of the vagina just beneath the urinary meatus. Exceptional accuracy is claimed for this reproduction, because it was drawn from a photograph of the vaginal entrance of a woman four months pregnant, taken by Dr. S. J. Mixer, and subsequently colored from life by Dr. H. P. Quinev.

versally attributed to Jacquemin (or Jacquemier?), but no author refers to the original place of publication, or gives any definite clue to the man. The most suggestive, as well as the earliest, reference to the subject is made by A. J. B. Parent-Duchatelet.¹ He says that "the examination of the genitals of prostitutes led to the discovery by M. Jacquemin of a new sign of pregnancy, which may become of great use in the field of legal medicine: this sign consists in a change of color of the whole mucous membrane of the vagina to a violet hue or even like the dregs of wine. The sign is so plain that M. Jacquemin is never misled by it, but relies upon it alone to establish the existence of that condition, independently of all other signs of pregnancy. I have been witness of curious tests to which M. Jacquemin subjected himself to prove how exact he is upon this point. . . . M. Jacquemin was able to determine the state of the mucous membrane in pregnancy in so large a number as 4,500 women."

Other authors of about the same period attribute the discovery to "Jacquemin," and I have no doubt that they mean Étienne Joseph Jacquemin (1796-1872), who was "médecin-en-chef de la Prison cellulaire de Mazas et médecin des prisonnières des madelonnettes et de la Prison de la Force," in which position he would of necessity have occasion to examine a large number of prostitutes, and be in constant and intimate relations with Parent-Duchatelet. E. J. Jacquemin was not a voluminous writer, but contributed a number of articles on medico-legal topics to the *Annales d'hygiène*, and the *Journal de médecine et de chirurgie pratiques*, none, however, upon this topic. To him I would therefore assign the merit of being the first to make this discovery in France, and not to Jean Marie Jacquemier (1806-'), to whom it is quite naturally attributed by recent

¹ *De la Prostitution dans la ville de Paris*. Deuxième Edition. Paris, 1837. Tome I, pp. 217, 218. As Parent-Duchatelet died early in the year 1836, this sign must have been communicated to him at least as early as the year 1835.

writers, because he was an obstetrician of renown, and wrote several articles on the vascular system of the uterus and placenta.¹

The next reference to this sign appears in a letter published in the *Journal for Medicin og Chirurgie*, Kjobenhavn, Bind ix, 1835, from Dr. Sommer, a Dane, then in Berlin; an abstract of this letter, translated into German, may be found in the *Berliner medicinischer Central-Zeitung*, Jahrgang vi, Stück 2, p. 36 (January 14, 1837), from which I quote: "Just imagine, on my first visit I heard an assistant in Kluge's wards, on examining the vagina of a syphilitic woman, immediately pronounce her to be pregnant. . . . To my question as to how this statement could possibly be made, Herr Geheim-Rath Kluge replied that a bluish coloration of the vagina existed at the *cul-de-sac* which surrounds the os uteri, and was an unmistakable sign of pregnancy, provided no hemorrhoidal condition was present. According to his assertion, it begins as early as the fourth week of pregnancy, or, rather, at the time when menstruation would have occurred had conception not taken place. This coloration increases with the progress of the pregnancy, and disappears with the lochia. The worthy Kluge was not content to give me assurances only, but showed me several pregnant women, about whom there was no doubt, as they were between the fifth and ninth month of pregnancy, and I saw with my own eyes the bluish coloration through the speculum vaginæ. He told me (although he had published nothing on the subject) that he had for years regarded this

¹ Since writing the above I have received this reference from Dr. J. S. Billings, of Washington, which effectually establishes the correctness of my argument. "The following quotation is from page 215 of the *Manuel des accouchements*, etc., par J. Jacquemier, Paris, 1846, Volume I: 'L'un de ces signes-indiqué par M. Jacquemin, est tiré de la coloration plus foncée de la muqueuse vulvo-vaginale; cette coloration plus intense, qui est quelquefois portée jusqu' au rouge brun, est réelle; mais, comme dans la plupart des cas, il est impossible de la distinguer de celle qui dépend des variétés individuelles ou de circonstances accidentelles; elle ne paraît pas même devoir prendre place parmi les signes rationnels les plus secondaires.'"

sign as infallible, except when the above-mentioned condition (hemorrhoidal) is present." The Danish editor here inserts a paragraph in which he says that this sign is already known to his countrymen.

Between Jacquemin in France, Kluge in Berlin, and some unknown physician in Denmark, must consequently be divided the credit of first recognizing the value of this sign of pregnancy, as it is no longer possible to discover whether the observations were independent or not. Manifestly, the discovery by Jacquemin and Kluge is attributable in both instances to the freedom with which the genitals of prostitutes were exposed, which was in marked contrast with the restrictions imposed by custom upon the examination of other women.

From this epoch we find, in most treatises on obstetrics, the bluish coloration of the vagina introduced among the signs of pregnancy, with, however, the most divergent opinions as to its value. These I deem it useless to cite, as none of the authors give any evidence that they have made a systematic investigation of the subject. I have made it my purpose persistently, for the past ten years, to repair this omission, and now beg to present to the profession the conclusions to which I have been led, together with an analysis of the observations and data upon which the conclusions are based.

Before setting forth the results of my own study, however, it seems not unprofitable to give a general impression of the current teaching on this subject at the present day, by quoting from those text-books which are universally accepted as the most authoritative.

Lusk¹ says: "Blood stasis, with enlargement of the vaginal veins, communicates a deep purple color to the vagina. As the requisite conditions (stasis from interference with return circulation) are fulfilled during gestation, Jacquemin and Kluge proposed to include this coloration of the vagina, which they compared to wine-lees, among the signs

¹ *The Science and Art of Midwifery*, New York, 1882.

of pregnancy. It occurs, however, though perhaps to a less intense degree, in prolapsus uteri, in cases of pelvic tumors, and the like" (page 11). "The speculum, though it furnishes us with a view of the coloration of the vagina, a most valuable sign, is rarely employed as a means of diagnosis" (page 107).¹

Leishman,² speaking of the vagina, says: "There is clear evidence here, also, of increased activity of the circulation, corresponding to that which we have found to exist in the internal genital organs. It takes the form, in this situation, of a venous engorgement, which is due, in part at least, to obstruction, caused by pressure of the gravid womb, and is indicated by a more or less livid color of the mucous membrane—very different from the rose color of the unimpregnated state. This ocular examination of the parts, although it may thus reveal a sign which is far from being the least important, is, for obvious reasons, a method of research which can not be generally adopted in the practice of midwifery," etc. (page 154).

Playfair³ says: "A peculiar deep violet hue of the vaginal mucous membrane was relied on by Jacquemier and Kluge as affording a readily observed indication of pregnancy. In most cases it is well-marked; sometimes, indeed, the change of color is very intense, and it evidently depends on the congestion produced by the pressure of the enlarged uterus. The same effect, however, is constantly seen when similar pressure is affected by large fibroid tumors of the

¹ I am led to infer, from these rather contradictory opinions, that Professor Lusk attaches considerable value to the sign when the bluish color is intense, but not otherwise. I would protest against the inference that might be drawn from the first quotation, that Jacquemin and Kluge first formulated a theory and then claimed that the facts might be found to coincide with it. The form of phrase must have been used inadvertently, for there is no evidence that either of them entertained this theory at all, and in both instances it is clearly shown that their opinions are based upon exceptionally large clinical observations.

² *A System of Midwifery*. Third American edition. Philadelphia, 1879.

³ *A Treatise on the Science and Practice of Midwifery*. Third American edition. Philadelphia, 1880.

uterus, and, therefore, for diagnostic purposes it is valueless" (page 144).

Cazeaux¹ says of the vagina in pregnancy, "that congestion is perceptible even in the capillaries; for it would be difficult, otherwise, to explain those livid spots, that color of wine-lees which the mucous membrane of the vagina and collum uteri show, to which attention has recently been drawn afresh by adducing it as a sign of pregnancy" (page 124).

Charpentier² says: "The mucous membrane of the vulva assumes a red, more or less vinous, tint. . . . It (vagina) becomes of a violet-red color" (page 411).

Naegele and Grenser³ say: "The blood which flows thither more abundantly gives to the mucous membrane of the vagina a bluish coloration" (page 86).

"When the coloration of the mucous membrane of the vagina is to be examined, . . . it is necessary to use a speculum" (page 112).

Spiegelberg⁴ says: "The distention and congestion of the venous plexes, often still further increased by obstruction, produces a dark-bluish coloration, which is visible throughout the whole canal, from the vaginal portion to the vulva. The turgescence and flabbiness of the external genital organs keeps pace with that of the vagina. They are more elastic, darker, their mucous surfaces are often covered with ectatic veins and venous plexuses," etc. (page 55).

Schroeder⁵ says: "Also the tumefaction of the vaginal portion, the roundness of the os, the edematous swelling, the velvet-like feel and increased secretion of the vaginal mucous membrane, as well as the wine-lees color, are impor-

¹ *Traité théorique et pratique de l'art des accouchements. Huitième édition.* Paris, 1870.

² *Traité pratique des accouchements.* Paris, 1883. Tome 1.

³ *Traité pratique de l'art des accouchements. Traduit sur la sixième édition allemande.* Paris, 1869.

⁴ *Lehrbuch der Geburtshülfe. Band 1. Lehr, 1878.*

⁵ *Lehrbuch der Geburtshülfe. 2te Auflage. Bonn, 1871.*

tant elements in the diagnosis, although I can not admit that they are decisive as Holst asserts" (page 77).

These quotations from the most accredited text-books of America, England, Germany, and France show, by the meagerness of the paragraphs, and the guarded or skeptical nature of the opinions, how little value is generally assigned to this change of color as an indication of pregnancy.

Dr. Robert Barnes¹ expresses, on the other hand, a most emphatic appreciation of this sign: "The most valuable sign of all is the violet coloration of the vaginal portion and the vagina, described by Jacquemier."

Dr. J. H. Carstens² is still more decided in his assertions, saying that the violet hue is not produced by any pathological condition; that he depends upon it for diagnosis in the first, second, and third months of pregnancy; and that it has never failed him.

I can find no other references to this sign in current periodical literature.

It will have been noticed that the above descriptions almost all speak of the violet color as seen on the collum uteri, or the whole extent of the vagina, and consequently require the use of a speculum; now, while I do not claim that the change is not perceptible throughout the whole extent of the vagina and collum uteri, I do maintain that it is equally manifest at the introitus vaginæ, when the labia are simply separated by the fingers. After satisfying myself on this point by numerous investigations with the speculum, I was consequently able to dispense with that instrument, and thus render the sign more generally and easily applicable.

As evidence that my conclusions are the result of a thorough study of the problem, I would say that during the ten years of this research I have made records of the examinations of about six thousand different women in an exclusively gynecological practice. The women were all placed upon

¹ *Diagnosis of Early Pregnancy. British Medical Journal*, 1868. Vol. ii, pp. 631-632.

² *Detroit Lancet*, 1880. Vol. iv, p. 112.

their backs on my gynecological table, with their thighs flexed to a right angle and their knees separated (Simon's position). The labia were then parted by the fingers, and the entrance of the vagina inspected. I made notes of any divergence of color from the normal in every patient, before any other method of examination was employed, seeking thereby to escape any bias that might be created in my mind by knowledge of the patient's condition otherwise derived. Of course I could not escape being influenced to a limited extent by the statements that had been previously made by the patient as to the absence of menstruation, and the super-vention of symptoms suggesting the probability of pregnancy. That the presumption thus liable to be established in my mind was not allowed undue weight in guiding my pen, I would adduce the fact that, of the 347 observations recorded 56 were made upon women who believed or feared themselves to be pregnant, yet in only two did I record the existence of such a change of color as to be diagnostic of pregnancy, according to the characteristics hereafter to be described.

The color begins as a pale violet in the early months, becomes more bluish as pregnancy advances, until it often assumes finally a dusky, almost black, tint; this last is familiar to every obstetrician. It is not due to pigmentation, but to an hypertrophy of the venous plexuses in the mucous membrane of the vagina (or a dilatation of the minute veins), induced by the afflux of blood to the uterus under the stimulus of pregnancy. The predominance of the veins in this location could alone account for the bluish color; moreover, when, toward the end of pregnancy, the color is most intense, varicose veins are plainly visible in the labia and in the legs. A. Breisky¹ thus describes the veins of the vagina: "In the columns the veins are large, numerous, and arranged in the form of plexus, their capacity increasing as we go backward. They give to the columns, especially in their lower segments,

¹ *Die Krankheiten der Vagina*. Stuttgart, 1879, p. 9.

the appearances of a cavernous structure. The veins which collect the blood from the mucous membrane form in the submucous tissue meshes running in the direction of the long axis of the vagina. They unite to form large trunks, which permeate the muscular layer, and contribute to form the so-called plexus venosus vaginalis between the vagina and the urethra and bladder in front, and vagina and rectum behind. Into this plexus pass numerous veins anteriorly from both bulbs of the vestibule, and posteriorly those venous branches of the labia which do not open into the pudenda. The blood is carried from this plexus by two quite large veins, which run along the posterior vaginal wall, on either side of the vaginal artery, and inosculate with the hemorrhoidal plexus. Gussenbauer finds the trabecular distribution of the venous plexus of the vagina to be analagous to the cavernous erectile organs, but, by its filling, the vagina never attains the degree of rigidity which is found in the erectile structure of the vestibule, but resembles, as Hunter asserts, a full sponge, the resistance of which is easily overcome." This being the normal condition of the venous system in the female, it may readily be conceived that, under the stimulus of pregnancy, the veins should so increase in number and size as to impart to the transparent mucous membrane more or less of their bluish color.

The natural color of the vaginal entrance does not differ materially from that of mucous surfaces elsewhere in the body, being of a pinkish hue in women of ordinary habit, more pale in anemic, and more red in plethoric, women.

In scrutinizing the color of this part in a large number of women I early discovered that, while in the majority the bluish tinge appeared over the whole vaginal entrance, there was a fair proportion in which the violet tint was confined to the anterior wall of the vagina, just below the urinary meatus, whence it shaded off into the normal pink color laterally. This, when distinctly perceptible, I soon found to be, in my practice, an absolutely sure sign of pregnancy.

There were, furthermore, a very few in whom the blue tint was universal, but more accentuated on the posterior wall of the vaginal entrance, which I found was valueless as a sign of pregnancy, unless the color was quite deep. The recognition of this peculiar localization of the blue tint on the anterior wall as a sure sign of pregnancy I feel is the most important new point in this communication.

My final division of the cases of pregnancy, according to the degree and localization of the blue tint, is as follows: I make two groups in which the women, though pregnant, exhibited: (1) *No* color, or a (2) *doubtful* one; in these, of course, the appearance of the parts gave no clue to the condition of the women; (3) a group in which a faint bluish tint was perceptible over the whole vaginal entrance, but was not sufficiently pronounced to be distinctive, I designated *suggestive*, and always had my suspicions aroused; (4) a group in which the bluish tint was as faint as in group 3, but was confined to the anterior wall, I termed *characteristic*; finally (5), a group in which the blue color was universally distributed, but so intense as to be unmistakable: this I called *deep general* tint. It is seen, therefore, that two groups (1 and 2) supply no aid in the diagnosis of pregnancy; one group (3) presents a sign which has value as presumptive but not conclusive evidence of pregnancy; while two groups (3 and 4) afford nearly absolute evidence of pregnancy. I qualify the last claim by the word "nearly," for the reason that I have seen the "deep general" hue *once* when the woman proved not to be pregnant. As the total number of cases in which the color was diagnostic was 146, the qualification is very slight.

The total number of cases in which there was reason for recording the color was 440, but in a certain number the data was imperfect, or the conditions of the patients indeterminate, so that the number of subjects available for calculation and analysis was reduced to 337, of which 281 were pregnant and 56 were not pregnant.

TABLE OF 281 PREGNANT WOMEN.

PERIOD.	VALUELESS.		Sug- gestive color.	DIAGNOSTIC.		Total.
	No color.	Doubt- ful color.		Charac- teristic color.	General deep color.	
At end of 4th week.....	..	..	1	..	..	1
" 5th "	2	1	..	..	..	3
" 6th "	1	1	3	..	1	6
" 7th "	1	..	1	..	..	2
" 2 months.....	17	13	21	4	4	59
" 2½ "	4	5	12	5	3	29
" 3 "	4	3	15	6	13	41
" 3½ "	..	1	7	2	3	13
" 4 "	..	2	8	9	8	27
" 4½ "	1	1	1	5	14	22
" 5 "	1	..	5	4	15	25
" 5½ "	..	..	3	2	5	10
" 6 "	..	..	..	2	19	21
" 6½ "	..	1	..	2	4	7
" 7 "	..	..	..	1	6	7
" 7½ "	..	..	1	..	3	4
" 8 "	..	..	..	..	4	4
Total.....	31	28	78	42	102	281

This table establishes certain facts with reference to this coloration of the vaginal entrance beyond reasonable doubt.

1. *That its absence is not to be accepted as evidence that pregnancy does not exist, especially in the first three months, when satisfactory evidence is most needed.*

In the first seven weeks it is shown to be rarely of much value, yet in five of the twelve cases it was sufficiently apparent to suggest to my mind that the woman might be pregnant, and thus protect me from involuntarily causing an abortion by the passage of the uterine sound, as it did in several of these instances.

It was practically absent ("no color," "doubtful color")—

At the end of 2 months in 51% of the cases.

"	2½	"	31%	"
"	3	"	17%	"
"	3½	"	8%	"
"	4	"	8%	"
"	4½	"	9%	"
"	5	"	4%	"

Of course, it is not claimed that these percentages, or many that will be offered hereafter, represent the true ratios, for the

number of cases is inadequate to warrant such a claim, but they are surely approximations to the truth.

2. That from (and including) the second month, this color is generally present, and often of such character as to be diagnostic.

In one instance it was diagnostic at the end of the sixth week—this woman had had six children and had a retroverted uterus; the color of the vagina was the only evidence of pregnancy except the non-appearance of the catamenia two weeks before.

The color was *suggestive* of pregnancy—

At the end of 2	months in	34%	of the cases.
"	2½	"	41% "
"	3	"	27% "
"	3½	"	45% "
"	4	"	30% "
"	4½	"	4% "
"	5	"	20% "
"	5½	"	30% "

The color was *diagnostic*—

At the end of 2	months in	13%	of the cases.
"	2½	"	28% "
"	3	"	46% "
"	3½	"	38% "
"	4	"	63% "
"	4½	"	86% "
"	5	"	72% "
"	5½	"	70% "

After (and including) the end of the sixth month, the color was *diagnostic* in all but one case, in which it was *suggestive*, and one in which it was *doubtful*.

The analyses on the positive side are supplemented, and the general conclusions strengthened, by the evidence of the following table, compiled from the records of patients who, for more or less good reasons, supposed themselves to be pregnant. In this class it must be observed that any bias, transferred from the patient's mind to my own, would work against the value of this sign in the diagnosis of pregnancy. Despite this disadvantage, the result confirms my statements in a most emphatic manner.

TABLE OF 56 WOMEN WHO PROVED NOT TO BE PREGNANT.

PERIOD.	VALUELESS.		Sug- gestive color.	DIAGNOSTIC.		Total.
	No color.	Doubt- ful color.		Charac- teristic color.	General deep color.	
1 week after menstruation.....	1	..	1	..	..	2
2 weeks " "	2	..	..	..	..	2
3 " " "	2	..	..	..	..	2
4 " " "	5	3	..	..	1	9
5 " " "	3	2	1	..	..	6
6 " " "	12	1	..	..	..	13
7 " " "	1	..	..	..	..	1
2 months " "	6	..	..	..	..	6
2½ " " "	2	1	..	..	..	3
3 " " "	4	..	..	..	..	4
4 " " "	1	2	..	..	..	3
5 " " "	3	..	1	..	..	4
6 " " "	1	..	..	..	..	1
Total.....	43	9	3	..	1	56

It is clearly a waste of time to calculate percentages with such figures. One case calls for special comment, in which, four weeks after menstruation, a woman exhibited the "general deep" bluish coloration otherwise diagnostic of pregnancy. There was noted an absence of the customary moisture of the vagina, which prevented my giving the color its full value as diagnostic of pregnancy. I could discover no other peculiarity to account for the color. It may be accepted as evidence of the occasional manifestation of the color at the time when menstruation was imminent, as is asserted by some of the early writers. This must be extremely rare, as I have observed no other instance.

The problem, why some women show this coloration of the vaginal entrance in pregnancy and some do not, I have sought to solve by tabularizing certain possible modifying circumstances, but the data are so few as to be of little worth. I have included only women who were two, two and a half, and three months pregnant, because the numbers are most evenly distributed at these periods, and the value of the sign is greatest.

The average *age* of 45 women, who showed "no" or "doubtful" coloration, was 26 years and 5 months; of 34

women, who showed "characteristic" or "general deep" coloration, 26 years and 4 months.

The average *number of years of married life* in 36 women, who showed "no" or "doubtful" coloration, was 6 years and 8 months; in 29 women, who showed "characteristic" or "general deep" coloration, 8 years.

The average *number of previous children* in 44 women, who showed "no" or "doubtful" coloration, was 1.82 children; in 32 women, who showed "characteristic" or "general deep" coloration, 2.22 children.

The average *number of miscarriages* in 43 women, who showed "no" or "doubtful" coloration, was 0.50 miscarriages; in 31 women, who showed "characteristic" or "general deep" coloration, 0.51 miscarriages.

The average *number of previous pregnancies* in 44 women, who showed "no" or "doubtful" coloration, was 2.32 pregnancies; in 32 women, who showed "characteristic" or "general deep" coloration, 2.73 pregnancies.

The average *number of months since the last child-birth* in 18 women, who showed "no" or "doubtful" coloration, was 30 months; in 16 women, who showed "characteristic" or "general deep" coloration, 29 months.

The average *number of months since the last miscarriage* in 6 women, who showed "no" or "doubtful" coloration, was 17 months; in 6 women, who showed "characteristic" or "general deep" coloration, 9 months.

The average *number of months since the last pregnancy* in 24 women, who showed "no" or "doubtful" coloration, was 26 months; in 22 women, who showed "characteristic" or "general deep" coloration, 23 months.

The contrasts presented by these figures are not sufficiently striking to warrant me in attributing any influence to these considerations in determining the presence or absence of the blue color of the vagina in pregnancy.

Another question of great moment is answered by the above tables: Do fibroid or ovarian tumors ever give rise to this color by pressure or otherwise, as asserted by most writers on this topic? I answer most emphatically, *No*. I

have had a large number pass under my observation during the past ten years, and have examined them with special care, invariably with a negative result. I must fain believe that the contrary opinions expressed have not been based upon observations, but upon the transmitted authority of the earlier writers, whose statements were made to accord with the theory that the blue color was due to stasis of blood from pressure upon the larger veins by the pregnant uterus, whence they inferred that the same was likely to result from the pressure of the uterus enlarged by a fibroid. I see no reason for believing that the change of color at such times is, in the slightest degree, due to pressure, but attribute it exclusively to the great afflux of blood caused by the necessity of nourishing the fetus.

I have observed but one cause of bluish color, apart from pregnancy, which may at times give rise to doubt, and to a certain extent detract from the absolute confidence reposed in this color as a sign of pregnancy. I allude to *erotism* on the part of the woman. In two or three instances among patients, seen in consultation, of which I can not now find the records, I have seen a very "suggestive," almost diagnostic, general bluish hue at the vaginal entrance when pregnancy did not exist. In one of these I was led to the true cause by observing the incessant, exaggerated flow of secretion from the utero-vaginal glands. I must further admit that a single woman who was exposed to pregnancy consulted me one week after the occurrence of the catamenia, which had been absent for three months before. There was considerable enlargement of the abdomen by ascitis, and the "characteristic" blueness of the anterior wall of the vaginal entrance, the blue tinge did not, as is usual, extend up the anterior vaginal wall. The cervix was hard and not patulous. My recorded opinion was that pregnancy seemed highly improbable. The case could not be included in my tables, because the correctness of the diagnosis was never established by subsequent examinations. I have never since seen the blue color in cases of ascitis.

The diagnosis of pregnancy is, under ordinary conditions, easy after the end of the third month of pregnancy. The degree of value attributable to the color of the vaginal entrance, in my practice, has been made apparent by the above tables. Complications occasionally exist which render the diagnosis doubtful even at a much later period. The principal of these are :

1. *Retroversion of the pregnant uterus*, when the body of the womb is less accessible to digital (or bimanual) examination, so that its softness and enlargement can not be made out, or may be confounded with old perimetritic effusion. I could adduce many cases in which the color has been the main reliance for the diagnosis.

2. *Extra-uterine pregnancy*.—In one of the only two cases that I have seen in the early months, the color of the vagina was “suggestive” as early as three and a half months, and helped to establish the diagnosis.

3. *Pregnancy complicated with fibroid tumors of the uterus*.—I have had in my practice seven cases of this complication, three of them before my attention had been called to this sign; one of them I did not see during the pregnancy; in the other three I noted the “deep, general color” at six months (when she was first seen), at three and a half months, and at five weeks, respectively; in the last case it was the only physical sign of pregnancy.¹

4. *Pregnancy complicated with an ovarian tumor*.—My notes of several cases are mislaid, so that I can not adduce actual observations.

5. *Pregnancy in women with very fat or tense abdominal walls*.

6. *Ignorance of the existence of pregnancy, or a desire to conceal it*.

7. *When the catamenia have continued after conception*.

8. *Conception while nursing, without the intervention of menstruation*.

¹ *Cases of Pregnancy and Labor complicated by Fibroids*, by James R. Chadwick, M. D. *Proceedings of the Massachusetts Medical Society*, June 9, 1885.

Numerous instances of these last four complications have established the great value of this sign of pregnancy in daily practice.

With reference to the length of time that the color persists after delivery, I can not speak from a large observation, but my impression is that the color ceases to be characteristic within a month. By the end of that time, such faint bluish tinge as is present is of a livid hue, and has assumed a grayish tint, presumably from the fatty degeneration going on in all the tissues of the vagina.

In conclusion, let me beg fresh observers of this sign not to judge of its worth until they shall have trained their eyes to detect the different shades and distribution of the color by many years' experience, as I have done.

DISCUSSION.

DR. T. A. EMMET, of New York.—Is this symptom as marked in the first pregnancy as it is after having borne children?

DR. CHADWICK.—I am unable to state that to-day, as my tables are not completely worked up. I have the data which will enable me to answer that question at some subsequent time.

DR. EMMET.—That is an important point, because in the later stages of pregnancy with all women it is about the same. But in the early months of the first pregnancy I think I have seen it less marked than where the women had previously borne children.

DR. W. H. PARISH, of Philadelphia.—I rise merely to ask a question, and it is whether Dr. Chadwick has had opportunity to make investigation to determine the nature of the discoloration. I understood him to say it is different from that of congestion. Writers upon this subject have stated that it is due to dilatation of the veins. If it is not vascular, it must be pigmentary in character. If due to deposition of pigment, that condition should be recognized post-mortem and microscopically, and, if due to pigment, the deposition would remain for some time after pregnancy.

DR. CHADWICK.—It is not such a congestion as we see in persons who are plethoric, although I have regarded it as distinctly due to vascularity, yet not the same *general* redness seen in plethora.

DR. WILLIAM L. RICHARDSON, of Boston.—I have seen the same discoloration, but it has seemed to me to be of questionable value, except possibly in first pregnancies, as I have seen several cases in which it has persisted after delivery. It will be interesting to see what the relative value of this sign of pregnancy was in primipara and multipara, as shown by a careful examination of Dr. Chadwick's paper.

DR. H. P. C. WILSON, of Baltimore.—I have seen this discoloration as well marked in women who were pregnant for the first time as in women who have borne children.

DR. EMMET.—I would ask Dr. Wilson if he has seen it in the early stages of pregnancy.

DR. WILSON.—I have seen it early in pregnancy, and in the first pregnancy, and I consider it one of the most valuable diagnostic signs of pregnancy in its early stages. It is an invaluable indication in cases where women come with the intention of misleading the physician. There is not a single positive sign of pregnancy until the fetal heart can be heard, which, of course, we can not hear before the third month. It is present in all stages, and in the early stages sufficiently well marked to make one skeptical of pregnancy, and cause him to advise the woman to come and see him a month later.

DR. ENGELMANN, of St. Louis.—I am glad to hear of this careful examination by Dr. Chadwick, and the conclusion at which he has arrived, that deepened color is a fairly good mark of pregnancy, and distinguishable in early stages. There are few cases in which it is not present, as I find, and my attention has been called to this sign during the past year especially by two cases, in which the patients had come, one on account of a fibroid of the uterus, and the other on account of some supposed ovarian trouble in which the history of pregnancy had not been taken, and no such possibility had been expressed by the patient. In showing the cases to the students, I remarked that if we had not had other causes for this enlargement of the abdomen, I would have supposed the women

to be pregnant, by reason of the cervical discoloration, and on examination, quite unexpectedly, it was found that pregnancy did exist. The sign is so evident, so easily found, that I deem it important, especially as it is noticeable in the slight shade of discoloration seen at an early date; this bluish color has cautioned me repeatedly in unsuspected cases.

DR. A. J. C. SKENE, of Brooklyn.—This is a perfectly normal color, belonging to the condition of pregnancy, and I have so often seen it that I look upon it as being one of the most reliable signs of pregnancy. It is produced by physiological hyperemia. Indeed, it is a first-rate illustration of the physiological hyperemia in the formative stage of any developing structure in which there is well-defined arterial and venous engorgement, which gives the characteristic color. It is a perfectly normal color, well defined, and very reliable as a sign of pregnancy. I have no criticisms of the paper to make, except that I object to the term "discoloration," and would suggest that Dr. Chadwick should call it the normal color of the vagina in pregnancy.

DR. JOSEPH TABER JOHNSON, of Washington.—Several years ago, when Dr. Chadwick was chairman of the section on obstetrics in the American Medical Association, I read a paper before his section on the "Diagnosis of Pregnancy in its Early Months." In speaking on this point, as one of the diagnostic signs of pregnancy, I suggested that the discoloration or congestion might be due to the growth of the uterus, and interference by its size with the return venous circulation, and that to a certain extent it was physiological. The point was, as Playfair says (page 142, second edition, *System of Midwifery*), that the same discoloration could be produced by a fibroid growth, which would have the same effect as an increase in the size of the pregnant uterus. I am glad that the subject has been brought up again, because this sign was almost done away with by that discussion. The sign of pregnancy declared by Dr. Smith, of Philadelphia, Dr. Mundé, of New York, and others, as being the most reliable in the early months, was obtained by manual palpation. The emphasis which Dr. Chadwick has again given to this sign makes it more valuable than it has heretofore been regarded, and I hope it may prove to be

of great assistance to us in making an early and correct diagnosis.

DR. PARISH, of Philadelphia.—With reference to the continuation of this discoloration after labor, in primiparous women, when involution of the vagina takes place completely and with some rapidity, the discoloration disappears with corresponding rapidity; but where subinvolution has existed and continued, the blueness is liable to continue for a much longer period. I have also observed, I think, that where in multiparous women this discoloration was exceedingly marked, the apparent increase of the blueness has been associated at times with subinvolution of the vagina.

DR. CHADWICK.—I have failed to recognize any persistence of this characteristic color after delivery, and I think I have said to Dr. Richardson before, that, if he were to study it as closely as I have done for the last ten years, he would recognize that it is never seen in any other conditions; that is to say, this characteristic coloration when it is plainly perceptible. The general discoloration of the whole vaginal outlet persists after the pregnancy, for periods varying from one to two months.

With regard to the effect produced by fibroids, I have taken pains to look, in consequence of the discussion referred to by Dr. Johnson, to see if I could recognize what I would call the coloration of pregnancy, and I have never found it in a single case; that is, any coloration which would have raised doubt in my mind as to the existence of pregnancy.