

son as practiced on the Continent. We feel that our end-results justify a continuance of our program of therapy, its concomitant symptomatic treatment, and the particular nursing of cases as practiced in our hospital.

The French theory of phylaxis is being supplemented with our active serum therapy in a second series of cases now in the course of preparation since completion of this paper, and we feel that it may have some merits.

We believe that any case suggestive of tetanus should have special consideration by the attending physician; also hospitalization and consultation, regarding massive dosage, with some one particularly experienced in this special phase of medicine.

In the near future we hope to present a supplementary study of about thirty-five additional cases, compiled since July 1, 1930, and covering a period of about two and one-half years, with special reference to active therapy and incorporating the principles outlined in this paper; stressing the necessity of securing relaxation of the patient before medication.

THE PROBLEM OF DYSMENORRHEA*

By LUDWIG A. EMGE, M. D.
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Discussion by Clifford A. Wright, M. D., Los Angeles; John W. Sherrick, M. D., Oakland; Ruby L. Cunningham, M. D., Berkeley.

DYSMENORRHEA, like headache, is an expression of discomfort, not a disease nor a pathologic entity. Experience with surgical section of the superior hypogastric or presacral nerve, or blocking of the uterocervical ganglia of Frankenhäuser by alcohol injection, leaves little doubt that pelvic discomfort is transmitted or localized by the pelvic division of the sympathetic nervous system. As far as is known, there are no motor fibers to the uterus contained in the nerve trunks, because sympathectomy is not followed by any disturbances in menstrual flow, parturition, bladder or anal control (Cotte,¹ Kennedy,² Fontaine and Herrmann³).

The ovaries and tubes receive their nerve supply from the ovarian plexus, which is formed by fibers from the middle mesenteric and the renal plexuses. Fibers from the ovarian plexus anastomose with the inferior as well as the superior hypogastric plexus. Afferent impulses arising in the ovaries and tubes may, therefore, be transmitted in two directions, while afferent impulses arising in or near the uterus ordinarily travel only by way of the superior hypogastric plexus. Both systems are linked to the mesenteric celiac and renal plexus. It is most likely that this intricate connection furnishes the explanation for nausea and vomiting incidental to severe dysmenorrhea, transmitting impulses which result in the reversal of the gradient of peristalsis.

EXPLANATION OF PELVIC PAIN

The basic explanation for any pain production in the pelvis rests, therefore, on any irritation or pressure affecting the pelvic sympathetic system. That the causes are many is evident. If such pain

occurs in connection with menstruation, we call it dysmenorrhea. The physical expression of this pain varies in degree according to the constitutional and psychologic endurance of a given individual. The evaluation of such an expression by a second or third person is an extremely difficult matter, and statistics based on such evaluations are simply personal impressions and not facts founded on an accepted standard. It is, therefore, not surprising that figures on dysmenorrhea are at such great variance. In Schröder's¹⁰ review in "Veit-Stoeckel's System of Gynecology," the frequency of dysmenorrhea ranges from 2 to 80 per cent. More recent observers have attempted to eliminate the personal factor, but figures are still considerably at variance.

REVIEW OF HISTORIES

Desiring to know how many of my own patients complained of dysmenorrhea, and with what success I had treated them, prompted me to review the menstrual histories of 4,500 consecutive patients. I recorded pain at menstruation roughly five hundred times, or 11 per cent, taking as my standard all expressions of pain more severe than a passing discomfort. I felt this to be a very liberal interpretation and fairly reliable, since I was dealing with an intelligent group of women, and since all recordings and interpretations were my own. In studying the literature, I have been impressed with the fact that observations made under similar conditions usually yield low figures, while composite observations made by a correlator from the records of others frequently yield high figures. This is particularly true of reports of large industrial and insurance concerns. Any figure reported is, therefore, only an expression of individual interpretation, and the further the interpreter or correlator is removed from the individual contact with the patient, the greater the possibility for error.

In 370, or 8.2 per cent, of the patients studied, the cause for the menstrual pain could be laid to a readily recognizable lesion. They were, therefore, classed as suffering from extrinsic or acquired dysmenorrhea. The remaining 130, or 2.8 per cent, patients did not present a readily demonstrable cause, and since their disturbance dated, in most instances, from the onset of menstruation they were classed as suffering from primary or intrinsic dysmenorrhea. Treatment in the former group was evident, and will not be discussed here.

ANALYSIS OF PATIENTS WITH INTRINSIC DYSMENORRHEA

An analysis of the 130 patients suffering from intrinsic dysmenorrhea brought out some very interesting facts. In the first place, most of these patients had received previous treatment without any relief, and forty-five of them had been operated because of dysmenorrhea. The variety of operative procedures is illuminating: appendectomy, 18; suspension with or without appendectomy and dilation of cervix, 6; resection of ovaries, 5; bilateral salpingectomy, 1; unilateral salpingectomy, 3; dilation of cervix and curettage, 8; radical cauterization of cervix, 2; and stem pessary, 2.

* Read before the Obstetrics and Gynecology Section of the California Medical Association at the sixty-second annual session, Del Monte, April 24-27, 1933.

TABLE 1.—Showing Relative Frequency of Dysmenorrhea

Correlator	University	Number Patients	Percentage of Dysmenorrhea	
Boynton	Michigan	2,282	.....	20.38
Cunningham	California	14,268	First 5 years	17.30
			Second 5 years	16.70
Rea	Pennsylvania	158	Freshmen only	20.00
Scott	Smith College	Not given	Class of 1913	56.00
			Class of 1923	31.70
			Class of 1931	32.40
Bell, Parsons and Schutz	Michigan	4,068 1929-1931	Slight pain	38.00
			Severe pain	11.00
Bell and Parsons	Michigan	840 1931-1932	Severe pain	12.00

No relief was obtained from the irradiation of the pituitary region in four, and of the ovarian region in two. It suffices to say that the indictment for hasty surgery is clearly expressed in these figures and needs no further comment.

It has often been said that if a woman marries she finds relief from menstrual distress because of regular sex relation. This is not always correct. In the figures presented next, the age of greatest sex activity also shows the greatest number of patients subject to severe dysmenorrhea.

In this series fifty-two patients were single, and seventy-eight married.

	Under 20	20 to 29	30 to 39	Over 40
Single	10	31	9	2
Married	1	56	20	1

It is also interesting to note here the low incidence of pregnancy: of the seventy-eight married women, only nine had been pregnant, of which seven had carried a child to term, one woman twice. It has been repeatedly pointed out that this form of dysmenorrhea and functional sterility go together because of failure of normal development of the uterus, and the frequently present functional failure of the ovaries. The latter fact is probably more important than the former, because functional disorders of the ovaries often explain infertility and nearly always go together with marked irregularities in menstruation. Failure in uterine development alone is not necessarily accompanied by menstrual disorders, and does not necessarily preclude sterility.

An attempt at correlation between the severity of pain with the type of the uterus, the body type, the psychogenic constitution, or the various manifestations of menstruation ended in failure. Whatever the results were for a given grouping could be matched by similar results in a group showing normal characteristics. In grouping pain, for instance, I found that it was severe in 20, incapacitating in 110, 48 of which had to go to bed for from 6 to 48 hours, with 33 experiencing nausea and vomiting for from 6 to 36 hours; 65 had pain for one day only, 53 for 2 days, 4 for 3 days, 6 for 4 days, and 2 for 5 days. Fifteen had premenstrual pain for from one to seven days, but none had postmenstrual pains.

Then I classified the patients according to body type, and recorded 87 as normal, 14 as obese due to anterior pituitary insufficiency, 5 as obese due to hypothyroidism, 13 as thin or asthenics, 10 as eunuchoids, 4 as boyish or infantile, and 2 as hyperthyroids. Similarly, on a basis of psychogenic constitution, I classed 87 as normal, 15 as hyperesthetics and 28 as emotionally unstable, and finally I grouped the development of the uterus as follows:

Type of Uterus	Normal	Hypo-plastic	Infantile	Hyper-trophied
Single	16	18	11	5
Married	32	26	8	14

With this I noted also 24 retroversions, 13 mild cases of cervical irritation, 15 patients with tender or spastic uterosacral ligaments, 5 with congenital erosions, 3 with acute antelexion, 4 with intrapelvic varicosities, and one with a chronic appendicitis. I then tried to link the type of the uterus with either degrees and days of pain, but again was confronted by the fact that the normal uterus was just as often associated with as severe a type and as great a duration of pain as occurred with any of the other three types of uteri recorded. Likewise, the length and duration of the menstrual cycle could not be linked with any of the other observations. There are the usual irregularities in all groups with about 40 per cent of the patients menstruating approximately four to five days every twenty-eight days.

PSYCHOGENIC MAKE-UP

Next an attempt was made to correlate the psychogenic make-up with pain appreciation. Among the eighty-seven normal individuals there were proportionately more severe cases of pain than among the emotionally unstable, although the fifteen patients classed as hyperesthetics all suffered severely, and longer than any number of the other two groups. It cannot be denied that certain individuals, because of functional nerve disorders, suffer more than others; but I am not willing to accept that the vast majority of dysmenorrhea is of psychogenic origin, as certain German observers would like us to believe. In Boynton's⁴ report attention is called to the fact that the high-strung individuals among the 2,282 students

studied showed dysmenorrhea less frequently than those of a normal control group. I have come to the conclusion that all attempts at correlating given factors observed in connection with intrinsic or primary dysmenorrhea are futile. Cunningham and Boynton, both studying large numbers of students, concluded that dysmenorrhea cannot be linked with changes in posture, physical exercise, minor infections, visual disturbances, and climatic changes. Most writers, on the other hand, agree that constitutional inferiority often is associated with menstrual pain. This is also true of the small series presented here, as pointed out above.

PRIMARY DYSMENORRHEA

There have been many theories advanced to explain primary dysmenorrhea. When T. B. Sellers¹¹ canvassed a large group of gynecologists in regard to their ideas on this subject, he received a sufficient variety of answers to fit almost any theory. The old dictum of Sims, *nulla dysmenorrhea nisi obstructiva*, apparently still has a great number of followers. Sixty-four per cent of the answers Sellers received gave congenital cervical stenosis as the actual cause for essential dysmenorrhea. This has been disputed by careful observers. E. Novak¹² tried to disprove the claim of Sims by the introduction of the "probe test": he reported that during the menstrual flow in dysmenorrhea, one could introduce a reasonably large uterine sound past the internal os of the cervix without finding any obstruction. Personally, I do believe that a spasmodic cervix or a cervix unable to relax under the stress of menstrual congestion because of a congenital imbalance of connective tissue and musculature could explain the pain produced. The amount of blood that normally flows through the cervical canal per minute is very small and perhaps no factor. Since dysmenorrhea is common with normal uteri, the inability of the cervical and uterine tissue to relax under the strain of congestion suggests itself as the more important factor. In this series, forty-eight, or about 27 per cent, of the patients possessed normal generative organs. The developmental disturbances in the size or position of the uterus do not offer a satisfactory explanation. Miller's¹³ theory of poor posture and poor muscle tone has been answered by Boynton⁴ in the negative. Disturbances in the vegetative nervous system, as explained by J. Novak and Harnik,¹⁴ can be linked up with the studies of Blotevogel and Poll,¹⁵ Kennedy,² Fontaine and Herrmann,³ and the preceding group of investigators studying the results of pelvic sympathectomy. Their conclusions deal with the most tangible part of the mechanism of pain production. In connection with this, one should also consider Schultz's theory of venous stasis, and E. Novak and Reynold's¹² theory of muscular irritability in the case of a disturbed estrinprogestin balance. That ovarian hormones do influence the development of the uterus in the presence of a still existing growth stimulus is fairly well established. Blotevogel,¹⁵ Kennedy,² and others have also shown that ovarian hormones, and particularly estrin, are capable of stimulating an atrophic ganglion of Frankenhäuser to regeneration.

The final answer to the question whether the influence of ovarian hormones or any other hormone is exerted directly onto the uterus, or to the nervous mechanism of the uterus, has not been given. All we know today is that, in selected cases, organotherapy effectually relieves dysmenorrhea. There are those who, like Clow,¹⁶ disclaim any result from organotherapy. Mazer and Goldstein¹⁷ lay this to either inactive materials or to insufficient dosage. Any mechanical method of treatment for dysmenorrhea which offers permanent improvement or complete relief must, above all, succeed in relieving irritation of the nervous mechanism of the uterus. How this is accomplished I do not know, except that a marked relaxation and softening occurs in the uterosacral and broad ligaments after stimulation of the uterus by certain electric currents, in particular galvanism. Adherents to the Brand method of pelvic massage claim the same results. In selected cases properly fitted stem pessaries or slow dilation of the cervix occasionally may give relief, but have not been particularly successful in my own experience.

TREATMENT

In undertaking the treatment of dysmenorrhea one should aim to take all possibilities touched upon into consideration. It goes without saying that, above all, we should improve the physical and mental condition of our patients, if that is necessary and possible. For the latter it is sometimes necessary to provide the patient with an effective anodyne to break the fear of another painful and distressing menstruation. Next we should aim at improvement of the uterine condition. I have found that in hypoplasias and in infantile types of the uterus the intracervical application of negative galvanism is very effective, both as a relaxing agent and as a stimulus for muscular development. At the same time we should aim to correct such endocrine defects as our present knowledge permits us to do. In the presence of spastic uterosacral ligaments which most likely are due to unrecognized cervical irritation, hydrotherapy and the use of detergent suppositories will frequently solve the problem. Sex matters must be discussed and regulated. In fact, prior to undertaking the treatment of dysmenorrhea the patient should be studied purely from a medical point of view, and all systemic disturbances should be corrected. If all measures fail, the patient may have to be subjected to more radical measures. If a displacement of the uterus is considered to be the underlying cause, certainly no suspension should be undertaken unless the patient has been tried out with a well-fitting vaginal pessary. If this rule is not followed the patient will join the army of the uselessly operated, of which I presented a fair contingent in the beginning of this report. If dilation of the cervix by galvanism does not bring relief, mechanical dilation with graduated dilators will be equally unsuccessful. I have come to the conclusion that if all measures fail, one should then attempt to block Frankenhäuser's ganglia according to the method of Bloss,¹⁸ using 70 per cent alcohol con-

TABLE 2.—Results

Method of Treatment	Number Patients	Relieved	Improved	Failure
Galvanism alone.....	33	18	9	6
Glycerin extract ovary.....	26	2	15	9
Estrogen, theelin, amniotin.....	12	2	4	6
Theelin and thyroid.....	3	1	2	..
Thyroid alone.....	18	8	6	4
Theelin and galvanism.....	12	6	4	2
Hydrotherapy, vaginal suppositories.....	20	10	9	1
Cauterization of cervix, suppositories.....	6	4	2	..
Total	130	51	51	28
Percentage		39.23%	39.23%	21.54%

taining 5 per cent novocain. This method is certainly as rational as that used for trigeminal neuralgia: it will not interfere with the motor function of the uterus or bladder, and can be carried out in the office, but requires dexterity and a good knowledge of pelvic anatomy. It is about as successful as resection of the presacral nerve, and decidedly simpler and less expensive for the patient. My own experience with this method, as well as with sympathectomy, is still limited, but the results have been uniformly good.

It is decidedly difficult to select patients for a given treatment according to fast rules. I have followed as closely as possible the outline. I have given in the previous paragraph. Frequently it has become necessary to combine treatments or to resort to a different form of treatment when the previous one has failed. Hygiene and psychotherapy perhaps play a more important rôle in obtaining relief than one can estimate. Whatever other measures were employed are outlined in Tables 2 and 3.

Of the twenty-eight failures, ten submitted to more radical treatment and eighteen did not return.

The percentage of failures was, therefore, ultimately reduced to 16.92 per cent. The amount of improvement recorded was sufficient to allow the patient to continue with her respective occupation without serious hindrance. All patients were followed up over sufficiently long periods to obtain accurate information as to the permanency of the result. In the group treated by galvanism more than half showed some form of mild recurrence, which brought them back for further treatment out of their own volition; this, I think, is sufficient proof for the efficacy of the method. The failures in organotherapy, particularly with the glycerin extract of the ovary marketed by Schiefelin & Company, can be explained by insufficient dosage, since this preparation is not standardized;

although I am convinced that it contains potent follicular hormone, judging from clinical results I have observed in the treatment of oligo- and hypomenorrhea. Failures with the standardized preparations may also mean insufficient dosage or inaccurate application of the principle involved. Thyroid therapy was not based entirely on the recorded basal metabolic rate, but on clinical phenomena such as lack of endurance, sluggishness, myxedematoid skin, and overweight. It was found that in this group a number of patients could tolerate much larger doses than would be expected from the laboratory findings and, in fact, did not report improvement until the individual tolerance had been ascertained. It is very interesting that a number of patients could be relieved by hydrotherapy, particularly hot baths during menstruation, and sedative vaginal suppositories. The use of the latter was begun a week before the expected period, and was continued through the period. This method was most frequently used when spastic uterosacral ligaments were present. The suppository used is a commercial preparation containing acetanilid, sodium borate, zinc borate, hydrastin in glycerogelatin. I make no claims for either of the ingredients, but from observations in the treatment of pelvic inflammatory disturbances I can state with certainty that these suppositories bring relief from pelvic distress. When using estrin containing substances I have always attempted to simulate the gradual increase of estrin production normally occurring with ovulation. It was therefore necessary to work out a scheme for each patient according to the known menstrual interval. When using the glycerin extract of the whole ovary, medication was carried into the menstruation, since this substance is supposed to contain a lutein factor. When using the pure follicular hormone, the maximal dose was reached about two days before the expected flow, and the patient was instructed

TABLE 3.—Results

Method of Treatment	Number Patients	Relieved	Improved	Failure
Stem pessary after dilation.....	3	..	..	3
Suspension of uterus.....	1	1	..	..
Suspension and resection of presacral nerve	2	2	..	..
Appendectomy	1	..	..	1
Nerve block by alcohol injection.....	3	2	1	..
Total	10	5	1	4

to discontinue treatment at that period; no active progestin containing preparations being commercially available, this scheme was thought to be the most logical. Of other endocrine substances used in the treatment of dysmenorrhea, Collip's emmenin has attracted some attention. I have no personal experience with the preparation. It has been used at the Stanford Women's Clinic with eleven patients. Doctor Fluhmann was kind enough to tell me that six patients were definitely relieved, two were improved, and three experienced no relief whatsoever. Collip's emmenin (Eli Lilly & Company) is an estrus-producing hormone soluble in alcohol, administered orally. Failure of results may again be due to the insufficient dosage or to faulty application of this substance.

Dosage.—The question of dosage for ovarian hormones does not so much rest with our inability to arrive at the required dose, as it does with the tremendous expense involved when large amounts have to be given. It is for this reason that I have resorted to the use of the unstandardized glycerin extract of the whole ovary.

Operative Procedures.—Among the operative procedures, stem pessaries failed me completely and I have given up their use. There is a great deal to be said against operative procedures for the relief of dysmenorrhea of the primary or essential type. I again call attention to the great number of surgical failures recorded in the earlier part of this report. In Europe sympathectomy has gained a great deal of favor, particularly among the French and Italian gynecologists. This operation is not easy and consequently often outside the reach of many casual surgeons. The alcohol block advocated by Bloss¹⁸ is certainly more simple, equally efficacious and inexpensive for the patient.

There are undoubtedly a great many other ways of treating primary dysmenorrhea. Because of our complete lack of knowledge of the actual mechanism involved, treatment must be empirical to a degree. Nevertheless, a serious attempt at analyzing the individual patient promises a far better result for improvement or complete relief than the mere acceptance of one method to be used for all patients suffering from this disturbance.

CONCLUSIONS

Of 4,500 consecutive patients of the intelligent class only 130 were found to suffer from primary or essential dysmenorrhea. Nearly one-third of them had previously submitted to surgical procedures without relief. A careful analysis of the individual patient and the application of sound principles of conservative treatment relieved or improved about 80 per cent sufficiently to permit them to carry out their duties without hindrance. Among more radical measures nerve block by alcohol injection of the uterocervical ganglia of Frankenhäuser offers the simplest solution.

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DISCUSSION

CLIFFORD A. WRIGHT, M. D. (2417 South Hope Street, Los Angeles).—Dysmenorrhea, as explained by Doctor Emge, is a very difficult condition to treat successfully, and this is reflected in the great number of patients who come to our offices having had considerable treatment, including surgical procedure, without results. The cause of the irregular results of treatment of dysmenorrhea is probably due to lack of more definite knowledge as to its etiology. As stated by Doctor Emge, this condition is like headache, being a symptom and not a disease entity, and undoubtedly can have a variable etiology. Most authors agree that abnormal contractility of the uterine muscle is the probable cause of the severe pain, and in a goodly percentage of cases this in turn may be due to endocrine factors. I am particularly interested in the endocrine phase of this condition, and when we consider, as explained by Doctor Novak in the *American Journal of the Medical Sciences*, February, 1933, that folliculin produces contractions of the uterine muscle and that progestin, and the urine of pregnant women, inhibits them; and also, as explained by Mazer and Goldstein, that estrin or folliculin apparently sensitizes the uterus to the action of pituitrin, the endocrine basis for the etiology of many cases of primary dysmenorrhea is logical. In Doctor Emge's group of 130 patients, thirty-five, or approximately 27 per cent, were definitely endocrine in type. Also of significance is the fact that in my endocrine cases of the menstrual age, 70 per cent had menstrual irregularities. Many women with dysmenorrhea have normal pelves. We may see dysmenorrhea in hypo-ovarianism, hypopituitarism, and occasionally in hyperthyroidism, but practically never in pure hypothyroidism. From an endocrine standpoint, the treatment would depend on the type of individual under consideration. Undoubtedly the use of a luteinizing principle, as that derived from pregnancy urine, should give results in many of these cases.

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JOHN W. SHERRICK, M. D. (350 Twenty-ninth Street, Oakland).—Dysmenorrhea is one of the most difficult therapeutic problems in gynecology; and because of its frequency and its incapacitating effects (it is estimated that 90 per cent of women experience some disturbance, and in at least 50 to 65 per cent it interferes with their daily routine) it is a very practical problem. It is, likewise, a most discouraging problem. It is particularly gratifying to have Doctor Emge's

explanation of the production of pelvic and reflex pain through disturbance of the intricate sympathetic nerve supply of the pelvic viscera, and his sane and comprehensive review of the whole subject.

Of the two types of dysmenorrhea, primary or intrinsic, and secondary or extrinsic, the former is the more important because of the difficulties it offers as to etiology and treatment. The extrinsic type, being associated with and due to obvious pelvic pathology, is relieved usually by treating this pathology.

Intrinsic dysmenorrhea is often a very difficult problem, and of the numerous theories offered in explanation no one is sufficient. Of these, one recalls the following: congenital stenosis of the internal os; narrowing of the internal os by premenstrual swelling of the endometrium; developmental irregularity between the uterine musculature and connective tissue elements with the venous congestion of menstruation, causing painful stimulation of the nerves of the uterus; genital hypoplasia with long conical cervix, acute ante-flexion, narrow internal os, tissue defects, etc.; deficient uterine and sacro-uterine ligament elasticity, narrow cervix and lower segment with deficient adaptability to menstrual congestion; chronic pelvic congestion from any cause, as overexertion, abnormal or prolonged sexual excitement, fatigue, constipation, faulty hygiene, etc., especially in the presence of the proper local and general background; abnormal physical and nervous unbalance and irritability, the so-called constitutional inferiority and psychogenic type, with lowering of the threshold of gain; endocrinopathies, thyroid, folliculin and progestin disbalance, etc.

No one of these theories furnishes a basis on which all cases of intrinsic dysmenorrhea can be treated. One must evaluate each case on its own merits and approach treatment largely from an empiric standpoint. Certain general measures are useful in all, as rest; heat in various forms; coal-tar derivatives, alone or combined with the barbiturates; codein, atropin to the point of tolerance; adjustment and control of the mode of life (adequate rest, sleep, relaxation, exercise, avoidance of too much social strain, etc.); bowel control; an adequate nourishing diet; correction of mental attitude; regulation of sex life, etc. In many cases we find marked benefit from the stimulating and relaxing effects of electrical dilatations. Some respond favorably to correction of endocrine defects—thyroid therapy, the use of estrin or antuitrin "S" or follutein, progynon, etc. Many cases fail to respond to all forms of therapy. We have not resorted to section of the sympathetic nerves or to alcoholic injection of the uterocervical ganglia. I feel, too, that we have not made sufficient use of hydrotherapy and sedative vaginal suppositories.

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RUBY L. CUNNINGHAM, M. D. (University of California, Berkeley).—As a member of the Student Health Service staff of the State University, I have had abundant opportunity to be perplexed as to the cause of dysmenorrhea and concerned as to its most effective treatment.

In an attempt to link painful menstruation with evidences of nutritional disturbance, or with dysfunction of the glands of internal secretion, a study was made of 14,268 young women who entered the University of California from 1920 to 1929. It was found that the group who have menstrual pain differ from the group who do not have pain, in three ways: more of them are underweight, more have a low blood pressure, and more are far-sighted. Doctor Boynton, of the Student Health Service of the University of Minnesota, adds to this list low hemoglobin determinations.

Poor nutrition, secondary anemia, and low blood pressure are evidences of constitutional inferiority noted by many observers and spoken of by Doctor Emge.

Young women of optimum weight for age and height, with blood pressures normal or above average, with satisfactory hemoglobin determinations and normal vision, often suffer severe menstrual pain. Those with marked evidences of constitutional inferiority

may have no pain. Dysmenorrhea cannot then be considered to be the result of constitutional inferiority. Pain with menstruation may lessen appetite, even cause nausea and vomiting, and thus contribute to malnutrition and anemia.

In the study of the University women, there was no evidence that glands of internal secretion other than those of the reproductive system are responsible for menstrual pain.

Fortunately, many cases of dysmenorrhea respond favorably to improvement in general health, to increase in exercise, to the use of antispasmodic drugs and products of the endocrine glands.

When medical therapy fails we turn to surgery. Too frequently surgery also fails to give relief and, in addition, is destructive. Doctor Emge has outlined a conservative method of attaining relief from pain which, pending the day when the cause of dysmenorrhea is clear and its medical therapy or its successful prevention possible, should find frequent application.

It is to be regretted that the uterocervical ganglia of Frankenhäuser is difficult to locate and to inject, and that for this reason this form of treatment must remain in the hands of the few skilled in its application.

BISMUTH INJECTIONS IN THE TREATMENT OF WARTS*

REPORT OF BISMUTH INJECTIONS IN THE TREATMENT OF SIXTY-ONE CASES OF WARTS AT THE COWELL MEMORIAL HOSPITAL OF THE UNIVERSITY OF CALIFORNIA

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AND

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DISCUSSION by Sophie A. Lurie, M. D., Los Angeles; Samuel Ayres, Jr., M. D., Los Angeles; Stanley O. Chambers, M. D., Los Angeles.

A RECENT article[†] by Dr. Sophie A. Lurie gave the results of treatment of verrucae by intramuscular injections of bismuth salicylate. A total of forty-nine patients were treated, of whom five were adults and forty-four were children. The technique of treatment was, in the beginning, weekly intragluteal injections of bismuth salicylate in doses appropriate to the age of the patient. Subsequent injections were withheld until such time as the regression observed had become stationary. The largest number of injections given was nine, and that in only one case. The statement was made that of the thirty-four cases observed over a sufficient period of time, the warts completely disappeared in all.

Among the students attending the skin clinic at the Cowell Memorial Hospital of the University of California at Berkeley, as well as in other clinics, we come in contact with many cases of warts. We have used all the modalities available in the treatment of such cases, and have felt that none of them were entirely satisfactory. Therefore, in the presence of such a problem, we read the article by Doctor Lurie with unusual interest:

* Read before the Dermatology and Syphilology Section of the California Medical Association at the sixty-second annual session, Del Monte, April 24-27, 1933.

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