carcinoma. The architecture of the cervical canal is such that drainage of the complex glands is not complete in the presence of the trauma of even physiologic dilatation, gland stasis favors the introduction, propagation and spread of organisms, and serves as a nidus of long-continued irritation with resultant permanent tissue alterations. It must be emphasized that this condition may prevail in the cervical canal in the absence of tearing of the cervical tissues apparent to inspection. Postnatal follow-up examinations only will reveal the extent of the tissue changes and determine the methods to be instituted to eliminate infection. It is not the laceration *per se*, but the associated infection which is the important predisposing factor in the development of carcinoma. The elimination of infection by the repair of lacerations, the removal of infected tissues of the canal by surgical or coagulation methods, are forward steps in the prevention of cervical cancer.

E. M. LAZARD, M. D. (1930 Wilshire Boulevard, Los Angeles).—I have read Doctor Bernstein's paper with great interest, as I have not made it a practice to do immediate cervical repairs, except for deep lacerations which cause hemorrhage which has to be controlled. For such cases I never depend on packing, but always control with sutures. If the nature of the delivery is such that deep lacerations are present, I prefer to wait for from five to seven days, when swelling and edema from the trauma of delivery have subsided and involution has begun. I have felt that better plastic results could be obtained than by the immediate repair. In the average case of normal delivery, the six-week postpartum examination usually reveals very little laceration or erosion, and what there is can be well cared for by linear cauterization. Of course, where there has been a difficult version or forceps delivery, deep lacerations are comparatively frequent. With Doctor Bernstein, I believe that routine inspection of the cervix after delivery should be done, and in view of his favorable results, I feel that immediate repair of deep lacerations should be done, provided the patient is in a hospital where the proper aseptic technique can be obtained.

MENORRHAGIA: THE RESULTS OF RADIUM TREATMENT—A FOLLOW-UP STUDY*

By MARGARET SCHULZE, M.D.
San Francisco

DISCUSSION *by Edward N. Ewer, M.D., Oakland; J. Morris Slemons, M.D., Los Angeles; Erle Henriksen, M.D., Los Angeles; C. Frederic Fluhmann, M.D., San Francisco.*

THE treatment of menorrhagia has always been a difficult problem in gynecologic therapy. With the development of the use of radium in gynecology, it was hoped for a time that this problem had been solved. It was soon found, however, that although in many cases the results were brilliant, in others the treatment was unsuccessful, or there were undesirable sequelae.

CLINICAL MATERIAL

It was with the hope of establishing definitely the limitations of this therapy, as well as determining the most desirable dosage to effect certain results, that this study was undertaken. It constitutes a follow-up upon the results of radium therapy in 204 women observed over a period of at least two years, and up to twenty years. Follow-up notes made upon succeeding clinic visits were utilized in all cases. In addition, a questionnaire covering the main points of information we wished to obtain was sent to all patients, and if there was any indication of dissatisfaction with the results of treatment from the questionnaire, the patient was requested to return for reëxamination and an interview, to determine the exact nature of her difficulties.

Only cases of so-called functional menorrhagia—that is, those in which there were no determinable gross pathologic lesions, are included in this study. The women ranged in age from fourteen to sixty years. Only one woman was over fifty-three years; but as she had menstruated without interruption, although irregularly, up to sixty years of age, it was felt that she belonged in the group. There were six young girls in the adolescent group under twenty years of age, 136 women in the adult group from twenty to forty-five years, and sixty-two women in the menopausal group of forty-five years and over.

TABLE 1.—*Incidence by Ages in 204 Patients*

Age	Number
14–20	6
20–45	136
45–60	62

For certain purposes of study, the adult group has been further subdivided into a young adult group of forty-five cases from twenty to thirty-five years, and a premenopausal group of ninety-one cases from thirty-five years up to forty-five years.

The duration of symptoms is indicated in Table 2.

TABLE 2.—*Duration of Symptoms*

	Adolescent Group	Adult Group	Menopause Group
One month or less	0	7	6
One month to one year	1	38	26
One to five years	4	58	20
Five to twenty years	1	33	10

The type of periods is indicated in Table 3.

TABLE 3.—*Type by Periods*

	Regular	Irregular	Continuous
Adolescent	0	0	6
Adult	27	69	40
Menopausal	3	40	19

By continuous bleeding is meant a duration of at least one month. Four of the patients had bled constantly for a period of from one to three years.

---

* From the Department of Obstetrics and Gynecology, University of California Medical School.

Read before the Obstetrics and Gynecology Section of the California Medical Association at the sixty-fifth annual session, Coronado, May 25-28, 1936.

Physical evidence of dyscrasia of the glands of internal secretion was relatively rare in this series, and is indicated in Table 4.

TABLE 4.—*Gland Dyscrasia*

	Obesity		Hirsutism	Skin Change
	Mod.	Ext.		
Adolescent	1	0	0	0
Adult	18	6	5	3
Menopausal	15	2	1	0

Adults—Breast atrophy 10, goiters 4, diabetes 1, dwarfism 1.

The basal metabolism has been taken as a routine only relatively recently, with the results that are shown in Table 5.

TABLE 5.—*Basal Metabolism*

	Normal	Over Plus 10	Below Minus 10
Adolescent	1	1	1
Adult	15	2	10
Menopausal	1	1	1

The marital status of the patients is indicated in Table 6.

TABLE 6.—*Marital Status*

	M.	S.	W.
Adolescent	0	6	0
Adult	110	18	8
Menopausal	56	0	6

The number of women who had pregnancies before and after radiation is indicated in Table 7.

TABLE 7.—*Pregnancies*

	Pregnancies Before Radiation	Pregnancies After Radiation
Adolescent	0	0
Adult	100	7
Menopausal	60	0

Only four of the women who had pregnancies after radiation went to term. Two had spontaneous and one an induced abortion. These cases will be discussed in more detail later.

Many of the patients had been unsuccessfully treated elsewhere before coming to us. Previous treatment is indicated in Table 8.

TABLE 8.—*Previous Treatment*

	Medical	Glandular	Surgical	Radiation
Adolescent	1	1	6	1
Adult	6	2	15	1
Menopausal	..	1	2	..

Surgical treatment consisted of dilatation and curettage in all except two of the adult cases where the patients had uterine suspensions, in addition to dilatation and curettage. Four cases had been curetted three times, and one patient four or five times before we saw her. A number had had gynecologic surgery for other conditions before the onset of their menorrhagia. This surgery is not included in the tabulation.

The results of the initial treatment with radium are given in Table 9.

TABLE 9.—*Results of Initial Treatment*

	Insufficient	Satisfactory	Overtreated
Adolescent	6	0	0
Young adult	21	18	6
Premenopausal	23	59	9
Menopausal	1	57	4

Overtreatment is rather difficult to define accurately, and its conception varies considerably with the age of the patient. In general, we have considered amenorrhea, or very infrequent and scanty periods, as evidence of overtreatment in the adolescent group and in the young adults under the age of thirty-five; whereas in women over this age it was not so considered, unless the patient herself made complaint, whether as the result of atrophic, vaginal changes, psychic changes, or severe menopausal symptoms.

The type of further treatment is given in Table 10.

TABLE 10.—*Further Treatment for Menorrhagia*

	Radium	X-ray	Surgery	Endocrin	Medical
Adolescent	3	1	2	3	2
Young adult	11	0	5	7	4
Premenopausal	5	7	5	3	1
Menopausal	0	1	0	0	0

Since certain patients received more than one type of further treatment, and one or two had no further treatment, although their menorrhagia was not controlled by the initial one, Table 10 is not exactly comparable with Table 9.

Most of the surgical treatment was done elsewhere on patients who had moved to distant locali-

ties, or who were so dissatisfied with our results that they did not return to us. Of the adolescents, one had three further curettages, and later x-ray and radium. Another had much endocrine treatment, and then a curettage and a presacral sympathectomy for pelvic pain. Of the young adults, four had hysterectomies, all done elsewhere, and one had a large cervical polyp removed by us. Two of the hysterectomies followed repeated radiation. Of the premenopausal women, four under forty had hysterectomies, one after repeated radiation. Three were done elsewhere, and one was done by us because of the development of multiple fibroids and an ovarian cyst. One woman in the forty to forty-five group had a later curettage. Later pelvic surgery for other reasons than menorrhagia was done in six cases.

The final result of all treatments is given in Table 11.

TABLE 11.—*Final Result—All Treatments*

	Insufficient	Satisfactory	Overtreated
Adolescent	0	2	4
Young Adult	3	27	15
Premenopausal	3	78	10
Menopausal	0	58	4

The criteria for overtreatment are the same as in Table 9. Hysterectomies in women under thirty-five are considered overtreatment, those in women over thirty-five were not so classified when the patient was satisfied.

The incidence of menopausal symptoms is given in Table 12.

TABLE 12.—*Incidence of Menopausal Symptoms*

	Mild	Severe	None
Adolescent	0	0	6
Adult	29	23	84
Menopausal	14	8	40

Contrary to the generally accepted opinion, severe menopausal symptoms after radiation were relatively infrequent.

The weight changes after radiation are given in Table 13.

TABLE 13.—*Weight Changes After Radiation*

	Gain	Loss	Unchanged
Adolescent	4	2	0
Adult	73	16	35
Menopausal	25	7	12

In sixty-eight women the gain in weight was moderate, below 20 pounds. Thirty-four women showed marked gain in weight, from 20 to 75 pounds. The greatest weight loss was 40 pounds, and a large number of the women who lost weight stated that they did so by dieting.

Changes in sexual function and atrophic changes which might lead to these are noted in Table 14.

TABLE 14.—*Atrophic and Psychic Changes*

	Frigidity	Dyspareunia	Vaginal Atrophy
Adolescent	1	0	0
Adult	7	9	22
Menopausal	2	2	9

It is probable that the changes indicated in Table 14 are more frequent than are indicated by the table, since this information was not requested in the questionnaire, but was volunteered by the patients in a number of cases, with very bitter complaints over the marital difficulties which arose. Later inquiry of a number of patients who were dissatisfied with the results of their treatment, but were very vague in stating why, showed that their dissatisfaction was of this nature. Vaginal atrophy was undoubtedly far more frequent than noted here, but so taken for granted after the artificial menopause that special note was not made of it.

TUMOR GROWTH

Since functional menorrhagia is now generally considered due to disturbed endocrine function, and since some of the more recent theories of tumor etiology relate tumors to disturbed endocrine function also, it was very interesting to see how many of our cases on later examination had developed tumors. Uterine fibromyomata were found by us on later examination in four cases; in one case in two years, in two cases in three years, and in one case thirteen years after the original treatment. In one of the three-year cases it was symptomless, in the other three cases menorrhagia recurred. In a fifth case, menorrhagia recurred four months after our radium treatment, and the "uterus and a tumor" were removed by another physician seven months later. In two cases ovarian cysts later developed—in one case complicating one of the fibromyomata mentioned above; in another without recurrence of the menorrhagia. Three cases later developed cervical polpi. Two women later developed carcinoma of the breast. Both were unmarried and had never been pregnant.

Three women developed diabetes during the course of the follow-up observation.

PREGNANCY

Since pregnancy followed radiation so rarely in this group, the cases that became pregnant later merit special mention. There were seven, all in the young adult group, from twenty to thirty-four years of age inclusive. None of the adolescents

became pregnant, either before or after radiation. None of the older women became pregnant after radiation, although the majority had been pregnant before. Of the seven who became pregnant after radiation, two had had no previous pregnancies, one single and one married woman. Only two of the group showed a typically hyperplastic endometrium; in one case the hyperplasia was mild but in the other, extreme. Three others showed premenstrual congestion. In one the tissue was lost, and one showed an edematous and hemorrhagic endometrium with interval type glands. Of the pregnancies, two aborted spontaneously; one was an induced abortion. One woman had a stillborn child at term, the cause unknown. One woman had three children, one normal full-term, one normal premature, and one full-term hydrocephalic, her second child. One woman had one normal, another three normal children. The radium dosage varied from 258 to 609 mc. hours in all except one case; the one with the vary marked hyperplasia, who had 952 mc. hours and a left salpingo-oöphorectomy, and had three pregnancies with the one hydrocephalic later.

DOSAGE

Attempts to work out a satisfactory dosage from our results proved most baffling. Individual variations in response to treatment were so great that the result in any given case was entirely unpredictable. Thus, amenorrhea was produced in a woman of forty-one by 400 mc. hours, and in a woman of thirty-four by 461 mc. hours, and in eight women of thirty-nine or over by doses between 500 and 600 mc. hours. On the other hand, a woman of thirty-five continued to hemorrhage profusely after two treatments, the first of 1,024 mc. hours and the second a year later of 1,594 mc. hours, and finally had a hysterectomy elsewhere. A woman of forty-five had regular and normal periods restored after 1,525 mc. hours, following an initial four months' amenorrhea. Numerous similar, although not quite so striking variations occurred. Attempts to correlate these variations with various factors were quite unsuccessful, whether radium element was used, as in the earlier cases, or radon, as in the later ones, the type of screening, the position of the uterus, with the thought that possibly treatment in a retroposed uterus with prolapsed ovaries might result in amenorrhea with smaller doses. Age appeared to be the one important factor, since women over thirty-five were very likely to have amenorrhea, or very scanty and infrequent periods after doses which did not usually produce this result in younger women. Thus, of twenty women of thirty-five years of age and over receiving only the small dose of between 500 and 600 mc. hours of radium, only six continued to bleed profusely, one had normal periods, four had scanty or infrequent periods, one was "cured" without giving details, and eight were amenorrheic either immediately or after a few scanty periods. With higher doses, the proportion of amenorrhea was even greater; thus, of one hundred women of thirty-five and over receiving over 800 mc. hours, seventy-eight were amenorrheic, while only eight continued to bleed profusely. Five were restored to normal periods, the remainder had scant or irregular ones. Singularly enough, two of the women who continued with profuse bleeding had, respectively, 1189 and 1488 mc. hours, while one who continued with normal periods had 1525 mc. hours.

On the other hand, in the fifty-one young women under thirty-five, amenorrhea was produced by one dose of radium in only three cases, although four more were amenorrheic after repeated radiation. However, the unpredictability of the radium reaction in an individual case is strikingly illustrated by the fact that in one case, aet. thirty-four years, amenorrhea with marked menopausal symptoms was produced by 461 mc. hours. The other two young women had large doses, 1124 mc. hours and 1206 mc. hours, respectively, and were the only two of the young group who received 1000 mc. hours.

RESTORATION OF NORMAL PERIODS

Restoration of normal periods resulted in thirteen of the young women with a single dose of radium varying from 125 to 922 mc. hours, and in five additional women after repeated radiation; that is 35 per cent of the women under thirty-five were restored to normal periods after one or more treatments. The prognosis was best in the 25 to 29-year-old group, of whom 57 per cent became normal, whereas of the adolescent only one, or 16 per cent became normal; of the 153 women of thirty-five or over, only ten, or slightly less than 7 per cent, became normal. Strangely enough, six of these were in the sixty-two women of forty-five years and over.

Repeated treatment with radium was employed in eighteen cases, three adolescents, ten young adults and five premenopausal women. One of the adolescents became amenorrheic, a second had scanty and infrequent periods, the third continued bleeding, had three curettages later and then x-ray treatment, after which she also had amenorrhea.

Five of the young adults were restored to regular and normal periods, one became amenorrheic, one had irregular periods. Two continued bleeding and had hysterectomies. One of the premenopausal women continued bleeding and had a hysterectomy, four became amenorrheic, one after having about three periods at yearly intervals.

CONCLUSIONS

Radium is not an entirely satisfactory treatment of menorrhagia. In the majority of cases the menorrhagia can be controlled, but normal periods are rarely restored, in only 35 per cent of the women under thirty-five, and in 7 per cent over this age. In the adolescent group of six, only one was restored to normal by radium. Only 13 per cent of the young women, and none over thirty-five, became pregnant after radiation. Marital difficulties, which were the result of atrophic changes, were not infrequently a source of considerable complaint. Satisfactory dosage is difficult to establish since although, in general, the results are fairly uniform, the individual variation in response to a given dose is so great that the result is entirely unpredictable. Amenorrhea has

resulted from 400 mc. hours, normal periods have been restored by 1525 mc. hours, profuse hemorrhage has continued after repeated treatment with 1024 and 1594 mc., respectively. Women over thirty-five will generally become amenorrheic or have very scanty or infrequent periods even with small doses. In younger women the prospect of a return to normal is somewhat better, but should never be promised. In the adolescent group, results with radium have been very poor, and it should not be used, or only as a last resort. A careful explanation of the possible consequences of the treatment is due the patient, and may save much dissatisfaction.

University of California Medical School,
Third and Parnassus Avenues.

DISCUSSION

EDWARD N. EWER, M. D. (411 Thirtieth Street, Oakland).—This is an exceedingly worth while follow-up. It shows that radium will nearly always control uterine hemorrhage, but that it is occasionally attended with undesirable by-effects. This means that each patient must be thoroughly informed of the limitations of the treatment.

Young women should not be treated unless the bleeding is definitely dangerous, and radium seems preferable to hysterectomy.

Young women are more likely to have menorrhagia due to endocrine dyscrasia, while older women have, in addition, metrorrhagia due to local causes, polyps, small fibroids, cancers, etc. However, young and old should be curetted for diagnosis. Malignancy in young women is being reported more and more frequently. However, academic interest in the biopsy alone does not satisfy the patient: she wants the hemorrhage controlled, and the curettage does not do it. Many upon whom I have used radium had had one or more curettements.

I find that many women over forty, who have been troubled with excessive flowing, prefer to have the change occur without further delay. To such I have given 1800 mgh. There have been no voluntary complaints about atrophic changes.

Table 11 in the report lists six treatments as insufficient, 165 as satisfactory, and thirty-three as overtreated. This may be and probably is better than could have been obtained with any other treatment.

Overtreatment may depend upon the point of view. Of the thirty-three in this class, fourteen were apparently severe enough to demand more than the initial radium dose. It may be that most of the thirty-three were better off than when hemorrhaging, and so would be classed by some of us as reasonably satisfactory.

In sixty-two cases of uterine bleeding in private practice, exclusive of diagnosed fibroids and cancers, my results are as follows:

Only two patients were under 20 years of age; ten were between 22 and 36 years; fifty-two were 36 years or over.

Of the two young women one was purpuric. Her hemorrhages had been long-continued and resistant to treatment, reducing her hemoglobin to 15 per cent. She received 300 mgh., with only temporary improvement. One year later she was given 400 mgh., and she has been well for the twelve intervening years. Her periods have been normal in quantity, the intervals being about five weeks.

The other young woman had lost two years of college work because of her severe hemorrhages. She spent much time in bed, and ran the gamut of medicinal treatment. Some 400 mgh. of radium produced amenorrhea lasting six months, and five years later there was another cessation of menstruation for five months. With those exceptions, she has been normal for seventeen years.

Of the ten women between 22 and 36, one had two premature labors at six months, and another was not relieved by the 400 mgh. treatment.

Of the fifty-two older women, one later required a hysterectomy and several complained of menopausal flushes, two describing them as exceedingly severe. The rest were well satisfied. I have no information, however, concerning the atrophic changes mentioned by Doctor Schulze. The answers she received to that line of questioning are significant and require consideration.

I use radium element screened with brass and rubber. When it is not desired to produce permanent cessation of menstruation, from 300 to 500 mgh. only are used. When complete cessation is desired, the dosage is 1,800 to 2,200 mgh.

Curettage has been useless in my hands, and certainly hormone therapy, as we know it today, does not produce the good results Doctor Schulze has obtained with radium in menorrhagia.

It has been a privilege to hear and discuss this informative review.

❊

J. MORRIS SLEMONS, M. D. (819 Pacific Mutual Building, Los Angeles).—The thoroughgoing character of the studies upon which Doctor Schulze's reports are based distinguishes the present essay. It deserves a large audience and thoughtful consideration; and it should serve to correct the indiscriminate use of radium—a practice that has become more common since commercial firms and the rental system have placed this agent at the disposal of unqualified persons. This reflection is not prompted by any desire to eliminate competition; for that reason perhaps it carries more weight. Whenever this treatment has been recommended in my own practice, the patient was referred to a competent radiologist. A conservative attitude, likewise, has led me to restrict such recommendations to individuals with whom the production of the menopause would not be an unwelcome sequel. At present it is impossible to predict when this will be the outcome, when not; for the dosage cannot be accurately measured in the case of the ovaries. Their anatomical location is too variable. My personal experience limited to the group of patients indicated has been entirely satisfactory.

For a broader view of the subject I have turned to a colleague, Dr. Erle Henriksen, who until recently was affiliated with the gynecologic clinic established by Dr. Howard Kelly, a pioneer in the application of radium to the treatment of disease.

❊

ERLE HENRIKSEN, M. D. (902 Pacific Mutual Building, Los Angeles). — Doctor Schulze's paper might have stressed even more emphatically the risk of routine radiotherapy for benign hemorrhagic metropathies. She has shown, by a carefully controlled series, that in the hands of the well-trained radiologist, radiation is not the dependable form of therapy, accepted by many physicians; while in unscrupulous hands it becomes dangerous.

Presumably routine studies of the endometrium were made. Unfortunately that has not always been true. Many women have had radiation without it, and to my knowledge a few have received radiation prior to a complete pelvic examination.

Traut and Kuder recently pointed out that about one-third of the so-called functional bleeding cases result from irregular shedding and irregular ripening of the endometrium. Cases of this type respond favorably to one or more curettements. Burnam believes that uterine bleeding, in the majority of instances, excluding malignant tumors, depends upon ovarian activity. Thus, in spite of the present glandular polemic, endocrine therapy should be employed before resorting to radiation. Doctor Schulze's figures, showing the marked discrepancies in the results of "ray dosage," prove that, with respect to the finer points, radiation therapy has not progressed beyond the stage of infancy. However, the pendulum seems to be on the downward swing; the use of radium in the young is becoming more conservative. Menorrhagia of benign nature should be treated by medical, endocrinal or conservative surgical therapy before resorting to radical measures, including radium.

❊

C. FREDERIC FLUHMANN, M. D. (Stanford University Hospital, San Francisco).—In this study of the radium treatment of abnormal uterine bleeding, Doctor Schulze has ably shown the many disadvantages which accompany this method of therapy in women during the childbearing period. I feel very strongly that the intra-uterine application of radium or x-irradiation of the ovaries is rarely indicated for uterine hemorrhage in younger women with

no gross pelvic lesions. In addition to the difficulties which Doctor Schulze has pointed out, it must also be remembered that irradiation may result in damage to germ-plasm, which can manifest itself in succeeding generations. It is true that many women have had normal children after such treatments, but time only can tell if an injury will not produce some defect in the offspring of the second and third generations. It certainly has been amply demonstrated in insects and there is good evidence that it may occur also in mammals.

On the other hand, the use of radium for the treatment of functional uterine hemorrhage in women of the menopausal age is an effective and comparatively safe method of therapy. We prefer the use of radium to x-ray since it gives an opportunity to do an extensive curettage and thus definitely eliminate the possibility of an existent carcinoma of the fundus uteri. The dosage employed varies from 1,200 to 1,500 mghrs. The bleeding is immediately controlled in the vast majority of instances, although a slight show may at times persist for some days or weeks. In the few rare failures it has been necessary to perform a hysterectomy subsequently. One of my patients returned with a carcinoma of the fundus uteri seven years after radium therapy, so this possibility must also be kept in mind.

DOCTOR SCHULZE (Closing).—A careful review of the pathology, with elimination of all but those conditions due to functional endometrial changes, was, of course, made in all this group, but limitation of time did not allow of its discussion here.

In general, the results in the older women were entirely satisfactory, and many wrote that they had never felt so well. A few, however, particularly of those whose menorrhagia had not been of long standing, or very troublesome, were intensely dissatisfied with the abrupt cessation of their functional activity. In the younger women, the fact that we were entirely unable to predict what may happen with a given dose of radium, and that we are so helpless to combat the results of overtreatment, must make us hesitate to employ it, except possibly as a measure of last resort. Several of the younger women, who had had long and serious bleeding, were at first delighted with their amenorrhea, or scanty periods, and their ability to resume the normal activities of youth; yet, later, wandered from doctor to doctor in an effort to overcome sterility or dyspareunia.

The possibility of damage to germ plasm, even in the first generation, is suggested by the one hydrocephalic among the comparatively small number of pregnancies following radiation in the series, and is an additional reason for being extremely cautious in its use. We feel, therefore, that except in cases where the artificial menopause is our objective, and the patient understands thoroughly what this entails, radium treatment should not even be considered except after the failure of all other available types of therapy.

MIGRATORY LABOR IN CALIFORNIA*

By WALTER M. DICKIE, M. D.
San Francisco

DURING the past ten years there has been in California a marked change in the type of casual labor which is employed on the farms and ranches of the state. Before 1927, the majority of the migratory laborers in California were Mexican, with a few Japanese, Italian-Spanish and Portuguese. In about 1928 there began to be a migration of unskilled farm labor from the Middle West to California. These people for the most part came from the eastern part of Oklahoma, northern part of Arkansas, southern part of Missouri and a few from Mississippi, Alabama, Louisiana and Texas. They are in the main whites of Anglo-American stock whose ancestors have lived for years in the hill area of the south and central United States. In 1935 a close check at the ports of entry to California shows that approximately 53,000 persons who could be classed as indigent or migratory entered the state from the 1st of January to the 1st of July. Of this number 90 per cent were white and about 10 per cent Negro.

An analysis of the reasons for the migration of this type of people to California might not be amiss. We have, first, the reasons for these people leaving their native habitat and, secondly, the need of increasing numbers of casual laborers in California.

These individuals were in their native states "share croppers" who tilled a small piece of land and divided the returns with the owner of that land. In the early part of this decade, the numerous drought seasons decreased the arable land and also the livelihood of many of the people. The amount of yearly return was further decreased by the low price of cotton, which was their main crop, and the policy on the part of the Federal Government for decreasing cotton acreage. During the same era in California, there has been a marked increase in the amount of land in truck farms and cotton acreage. At present, it is estimated that 30 per cent of the large-scale cotton farms of the United States are in California, also 60 per cent of the large-scale truck farms and 60 per cent of the large-scale fruit farms in the United States are in this state. An estimation made in 1935 by the Federal Government shows that the number of casual laborers required is approximately 50,000 in January as a minimum and approximately 200,000 in September as a maximum.

If we look into the ancestry of the majority of these people, we find them of Anglo-American stock whose families have for generations lived in the more retarded areas of the United States, whose customs, education and standard of living are far below the average for this country. We further find that they come from an area where the incidence of the communicable diseases is high, where the sanitation is poor and where the public health activities have been limited. On their migration to California they therefore brought with them a lower standard of living, endemic foci of communicable diseases and a long background of malnutrition.

Such a large group of these persons coming into the state has thrown an added burden on the local charities, the local and county health departments, the state relief agencies and on the State Department of Public Health. It has been felt that two major considerations were necessary: first, the resident population of the state must be protected as far as possible from the communicable diseases such as typhoid, smallpox and malaria that these people might bring with them; secondly, we must, as much as possible, rehabilitate these individuals especially in housing, sanitation and nutrition so

* At several meetings the public health problems involved in migratory labor settlements have been up for discussion in the California State Board of Public Health. At the editor's request, the Director of the Department has submitted the following memoranda on the subject. See also in this issue: Editorial Comment on page 74, a letter on page 131, and press clippings on page 141.