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Chorionepithelioma

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I. CASE REPORT

CHORIONEPITHELIOMA WITH METASTASES

Case is white female, 25 years old, admitted to University of Minnesota Hospitals 9-26-33, discharged 10-13-33 (17 days); readmitted 12-19-33, discharged 1-2-34 (14 days); readmitted 4-25-34, expired 5-12-34 (17 days). Total stay - 48 days.

Last pregnancy

3-2-34 - Normal delivery. When menstruation returned, periods were irregular and there were several months in which menstrual flow did not occur.

Enlarged uterus, hemorrhages, 18 mo. later

8-1-33 (about) - Uterus enlarged rapidly. Began to flow continuously and had 3 severe hemorrhages.

8-15-33 (about) - Curettage performed. Hydatiform mole removed. Patient previously passed "2 gallons" of material. Recovery following this operation was stormy because of extreme anemia due to blood loss.

9-1-33 - Bleeding began again and continued. In bed for about 2 months.

Enlarged uterus, bleeding, anemia

9-26-33 - Admitted. Physical examination - Without special note except for smooth mass extending out of pelvis to within 2 cm. of umbilicus. Pelvic floor relaxed but otherwise negative. Bloody discharge present. Cervical os soft and patulous, freely movable without pain. Speculum shows old laceration with erosion and bleeding from uterine cavity. Corpus anterior, smooth and soft, forming abdominal mass palpated above and suggesting normal pregnancy. Adnexa apparently negative. Laboratory: Urine - negative. Blood - Hb. 32%, rbc's 1,750,000 wbc's 11,300, Fmn's 54%. X-ray of chest - negative.

Mole

9-28-33 - After preoperative transfusion, curettage done and one rough area found. Examination of material shows presence of decidua cells which, in areas, form considerable sized sheets of tissue.

Occasionally, cystic structure lined by decidua cells seen. No villi present. Examination of material gives no information as to whether or not decidua formation is malignant or benign. No penetration of deeper structure recognized. No excess of mitotic figures. Material resembles in all respects that seen in curettings taken from normal pregnancy except that villi are not present.

10-13-33 - Uterus decreased in size, now only slightly larger than normal, freely movable, no pain. Bleeding stopped. No fever. Patient up and about. Discharged and asked to return in few months for observation.

Persistent discharge, hemorrhage

12-18-33 - Felt fairly well since discharge. Had persistent sanguineous discharge, necessitating one to two pads daily. Suddenly developed profuse hemorrhage with numerous clots. Physician inserted vaginal pack. Patient referred to hospital. States that she passed several small gray nodules that appeared like tapioca.

12-19-33 - Readmitted. Physical examination: Pale and very weak. Temperature 99.4. Pulse 98. Uterus - enlarged to about that of 2½ month's pregnancy; cervix small; adnexae negative. Packing removed. No further bleeding. Laboratory: Urine - negative. Blood - Hb. 63%, rbc's 3,330,000, wbc's 6,400.

12-20-33 - X-ray of chest and lipiodol injection of uterus - no evidence of metastasis in lungs. Injection of uterus with iodized oil shows rather small uterine cavity with a number of defects within it. After 4 hours, material had spread through uterine cavity and is distributed in very irregular fashion. Appearance is fairly characteristic of chorionepithelioma or hydatid mole, although other multiple tumors of mucosa of uterus might produce same findings.

Second curettage

12-22-33 - Curettage performed. Considerable hemorrhage. Transfusion 600 cc. Microscopic examination shows

Several pieces of chorionic mole throughout all section. Some of mole is necrotic and apparently dead. Other portions of mole are actively growing. Some sections show decidual cells which have disintegrated appearance. Whole material gives no further information as to process in uterus. Some of decidual cells appear to be within muscle layer. No good evidence of any malignant change. Conclusions - hydatiform mole, probably without malignant change.

Radium

12-23-33 - On basis of microscopic study of curettings and clinical features, it was decided to follow another period of conservative treatment. If bleeding follows this curettement, hysterectomy will be done. 800 mg. hrs. radium to uterus to supplement curettage.

1-2-34 - Discharged.

Better

2-17-34 - Declines to return for observation as she states that she is feeling better. Examination by physician shows uterus approximately normal in size. Has menstruated for 4 days but there has been a brownish discharge since.

Discharge recurs, hemorrhage

4-1-34 - Brownish discharge following menstrual period persisted for about one week and following this there has been no other discharge. Felt well. Suddenly developed hemorrhage of dark blood and many clots.

4-25-34 - Readmitted. Since last hemorrhage has had recurring irregular bleeding. Has been some pain during time of flowing. Physical examination - negative except for pelvis which shows uterus enlarged to about size of 2½ months' pregnancy. Laboratory: Urine - trace of albumen, few wbc's, occasional rbc's. Blood - Hb. 80%, wbc's 10,900, normal differential. X-ray of chest - negative.

4-30-34 - Numerous pelvic examinations by Staff - general concensus of opinion is that uterus is 2 to 3 times normal size. Some irregularity along left horn. Cervix slightly softened but there does not appear to be any softening of preg-

nancy. Friedman test positive. X-ray of chest - negative, no metastasis.

Hysterectomy

5-4-34 - Exploration: complete hysterectomy performed. Examination of uterus shows uterus enlarged to about 3 times normal size. Some irregularity in contour of uterus along left horn and softening in this area. Uterus sectioned and cavity is moderately enlarged, and fairly smooth. Throughout fundus toward left side, muscle of uterus is infiltrated with tumor. Tumor is growing in the form of irregular tortuous cords within muscle and apparently following venous sinuses. Cut surface of uterus in area of tumor shows striking appearance to antemortem thrombi within venous channels. External surface of uterus smooth. Lower fundus and cervix show no change. Microscopic examination shows presence of decidual cells within muscle in broad cords and sheets. Cells have appearance of normal decidual cells. They have approximately same appearance at this time as they had in 2 previous biopsies. Many areas appear like tumor thrombi in vessels. At one point, vessel wall can still be recognized.

Cough, distention

5-7-34 - Abdomen markedly distended. Severe cough with expectoration of blood-stained sputum. Chest - negative.

Evisceration

5-8-34 - Considerable seroganguineous discharge from wound. Taken to operating room. Silkworm gut sutures placed through anterior abdominal wall.

5-10-34 - Still coughing. Marked distention which is fairly well controlled by nasal suction. General condition seems poor.

5-12-34 - Expired.

Autopsy

Evisceration

Body is well-developed, fairly well-nourished, white female, 25 years of age, measuring 166 cm. in length and

weighing about 125 lbs. Rigor present. Hypostasis purplish and posterior. No edema, cyanosis or jaundice. Pupils equal, each measuring 4 mm. in diameter. Subumbilical incision closed with silkworm gut. When these are cut, edges immediately separate and loops of bowel are visible in depth of wound.

Early peritonitis

Peritoneal Cavity shows slight excess of fluid. Some of fluid in culdesac is turbid. Serous surfaces smooth and glistening but there is definite injection of bloodvessels on several of loops of bowel.

Pleural Cavities show no adhesions or excess fluid. Pericardial Sac shows no excess fluid or adhesions.

Pulmonary Metastasis

Left Lung weighs 400 grams, Right 450. There is almost complete lobar atelectasis of both lower lobes and partial collapse of posterior parts of each upper lobe. These areas are bluish, flabby, red on cross section, and show no diffuse or localized areas of bronchopneumonia. Bronchi are red, puffy and contain small shreds of mucus. In lung parenchyma on both sides, there are numerous nodules. These are chiefly subpleural in location. Largest measures about 2 cm. in diameter. On cross section, they have a reddish-brown color and diffusely infiltrate through the lung parenchyma. Pulmonary arteries to these areas contain no emboli, ruling out the possibility that these are post-embolic infarctions.

Heart weighs 270 grams. Musculature is firm. No infarction or softening of myocardium. Epicardium is smooth. Valves are well formed. Coronaries are soft and patent throughout. Root of the Aorta is smooth.

Spleen weighs 125 grams, is soft, shows abundant pulp. No tumor.

Liver metastasis

Liver weighs 1600 grams. Markings are well retained. No chronic passive congestion. Bile ducts show no dilatation or fibrosis. In center of right lobe, there is a small tumor measuring about 1 cm. in diameter which has a reddish color and is

very friable.

Gall-Bladder has a thin wall; no stones. Mucosa is smooth. Ducts are not dilated.

Gastro-Intestinal Tract shows no change other than dilation of blood vessels in several loops already described. There is some distention with gas. No ulcers, polyps or tumors. No implants on serous surface.

Pancreas is soft, shows no tumor or cysts.

Adrenals are well developed on both sides. No evidence of tumor.

Capsules of Kidneys strip easily. Each kidney weighs 140 grams. Slight cloudiness is present. Surface is smooth. Pelves are not dilated.

Bladder has a thin wall. No cystitis or tumor infiltration.

Genitalia: Uterus has been removed at upper end of vagina. Some necrosis along line of suture. Ovaries, tubes and remnants of adnexae are buried in this line of closure. Ovaries are slightly congested. No cysts or tumors. No tumor tissue found in adnexae, pelvic floor or sides of pelvis.

Lymph Nodes along aorta, iliac vessels and in mediastinum show slight enlargement. Enlarged nodes are soft, pink and apparently hyperplastic. No tumor made out grossly.

Head: Scalp, calvarium, dura and meninges show no change. Cerebrospinal fluid clear and not in excess. Convulsions of brain are well marked; no hemorrhages. Brain is cut in serial sections and there is no evidence of hemorrhage or metastases.

Diagnoses

1. Chorionepithelioma with metastases to liver and lungs.
2. Bilateral pulmonary atelectasis.
3. Cloudy swelling of kidneys.
4. Pelvic peritonitis.
5. Early general peritonitis.

Microscopic

Lung - many thrombi in small arteries. In several of these tumor cells can be seen. Apparently tumor emboli have lodged in the vessels and thrombosis has extended from these.

Liver - tumor metastasis has the

same characteristics as that in the uterus.

Other organs - show no significant changes.

II. ABSTRACT

CHORIONEPITHELIOMA

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Historical

Histology first described by
Sanger in 1892, and called sarcoma
uteri deciduoma cellulare.

Syncytium differentiated from
Langhan's layer in 1895 by Marchand
and tumor named chorionepithelioma in
1898.

Frequency

Relatively rare. Only 571 cases
reported in literature up to 1919.

Douglas Symmers of Bellevue Hospital
in New York found no chorionepitheliomas
in 12,000 autopsies.

Black cites a composite series of
76,077 pregnancies in which 80 moles
occurred, and 6 chorionepitheliomas.
This means 1 chorionepithelioma in
12,813 pregnancies and 1 tumor in 13.5
moles.

Etiology

Usually cells of fetal origin pre-
cede the tumor, explaining its frequency
in the child-bearing age.

Ladenski, 90 tumors with average of
4.2 pregnancies for the group.

Teacher, 189 tumors.

First pregnancy	5%
After first pregnancy	15%
After second and third	28%
After five or more	52%

Berquits, 158 cases	
Second pregnancy	21%
Third pregnancy	20%
Fourth or more pregnancies	47%

Bouregard, 178 cases	
Nulliparous	22 cases
Over five children	66 cases

Character of previous pregnancy:

Pollosson and Violet, 455 cases preceded by	
Hydatid mole	45%
Abortion	30%
Labor at term	21%
Ectopic pregnancy	2.5%
Doubtful history	6 cases

Hitschmann's and Christofollette's

240 cases:	
Hydatid mole	48%
Abortion	30
Labor at term	21

Over 1/2 followed a mole and 1.3 abortion, with the remainder scattered.

Meyer cites the frequency of moles in Mall's series of abortion specimens and suggests some apparent origins from abortion may actually have a mole as a basis. Same factor to lesser degree may apply at term. Not more than 5% of moles are followed by chorionepitheliomas (Sunde).

Age Incidence

Teacher's series, 189 cases	
Between 20-40 years	67%
Under 20 years	6 cases
Over 50 years	9 cases
Average age	33 years

Period of Latency

May be synchronous with pregnancy or follow after 31 years.

Unusual periods may be based on unknown abortions.

Vineberg found two chorionepitheliomas while evacuating moles.

Pick reports a mole at four months

with metastasis in vagina.

Latent periods over 3 years are uncommon.

Location of Growth

Usually in uterine wall at the site of implantation of ovum. 22 cases of chorionepithelioma have been reported in pregnant tubes (up to 1916).

Ectopic growths occur:

In vaginal fornix (Sternberg).
Non-pregnant tube.
Broad ligament and at bifurcation of internal iliac artery (Lecene and Engelhorn).
Kidney (Muto, 2 cases).
Testicular tumors and chorionepitheliomas of the female may arise from undifferentiated ectoderm in a teratoma.

Pathology

Ewing describes three types:

- (1) Chorio-adenoma destruens.
- (2) Chorio-carcinoma.
- (3) Syncytioma and syncytial endometritis.

(1) Chorio-adenoma destruens: Grossly uterus is large with thick walls. Mole present either in cavity in wall or scattered throughout. Perforation occurs (7 cases, 6 deaths). When in situ, bulky tumor mass is adherent over implantation site. Hemorrhage and suppuration frequently present. Shreds resembling clot remain adherent and continuous with distended sinuses after expulsion of mole. Great variation in size of vesicles with many opaque coherent nodules in expelled tissue is suggestive.

Microscopically, overgrowth of Langhan's cells, syncytium and connective tissue present. Langhan's cells occur in masses or plates at bases of villi. Syncytium is in well defined buds of strongly acidophilic cytoplasm with abundant hyperchromatic nuclei. Metastases are uncommon.

(2) Chorionepithelioma.

(A) Typical form shows syncytial masses interwoven with plates and layers of Langhan's cells with areas of necrosis and hemorrhage. Maternal vessels eroded, no indication of new connective tissue formation or vessels.

(B) Atypical form shows less regular arrangement. Absence of syncytium, scarcity of Langhan's cells. Invasion of muscularis by large mononuclear and polynuclear cells called wangering syncytial cells. Uterus enlarged and walls laden with cell masses, areas of necrosis and necrotic debris.

Metastasis are universal and rapid.

(3) Syncytioma: described as purely syncytial but at least some portions show Langhan's cells (Marchand).

Metastasis

Cell masses are distributed by the blood stream and secondary growths closely resemble the primary growth histologically. Areas of predilection are in order, lung, vagina, liver and vulva.

Growth in lung most frequent in base and apex, may be massive or slight, symptomless or marked by dyspnea, hemoptysis, severe cough and chest pain.

Vaginal metastasis may be single or multiple, of variable configuration often resembling thrombosed veins with a tense cystic character. Usually brown to violet in color, grow rapidly, with necrosis, ulceration and frequently severe hemorrhage. These metastases may occur early and be of value in diagnosis.

Nodules in the broad ligaments, tubes and ovaries are distinguished by their reddish-brown color, or dark color and hemorrhagic aspect on section.

Liver nodules are widely disseminated and usually give rise to no symptoms.

Nodules or fairly large tumors occur rarely in the kidneys and urinary passages

and are usually symptom-free.

Nodules in the central nervous system are not rare; vary in size from a lentil seed to a hen's egg in size, occur most commonly in the occipital lobe, may be multiple and are not ordinarily hemorrhagic.

Ovarian changes

The typical lutein change involves not only the follicular epithelium but the stroma as well, and are assumed to be the ovarian response to excessive pituitary stimulation in turn by the chorionic tissue. (Atypical case in connection with pituitary tumor reported by Wagner).

Typical ovarian cysts or multiple cystomas with thin walls, lined with yellow epithelium and filled with clear or blood-stained fluid occur. The incidence of large ovarian cysts in Cottalordo's series was 9.5% with chorionepithelioma, and 59% with hydatid mole. Microscopic studies of all ovaries from these cases should show much higher incidence of luteal change than these figures indicate (Novak). Spontaneous resolution is the rule. Removal is indicated only by pressure symptoms or torsion.

Pituitary changes

The chromophobe cells, like the typical reaction during pregnancy, show change into large cells with clear somewhat irregular nuclei with dust-like cytoplasmic granules staining pink with acid fuchsin and eosin, in both male and female patients.

Diagnosis

Positive physical findings are late. Hemorrhage at any time following hydatid mole is alarming.

Persistent hemorrhage following abortion with microscopic evidence of villi is not significant as a rule. Metastatic nodules in vagina or vulva are pathognomonic. Vaginal hemorrhage following pregnancy or its perversions usually points to the diagnosis first

but pulmonary symptoms or x-ray evidence of lung metastasis may suggest the diagnosis primarily. Careful uterine exploration particularly after a mole is essential. Vineberg recommends abdominal hysterotomy when the palpation of an elevated firm nodule with craterlike excavation will be conclusive.

Mircoscopic trophoblastic tissue without villi shortly after some form of pregnancy is the usual criterion for diagnosis. The diagnosis is in doubt in the presence of villi. The presence of fresh trophoblastic tissue three weeks after removal of all villi from a uterus is alarming. Curettage and rough handling at hysterectomy carries the marked danger of dissemination of metastasis by the blood stream. Most rapidly fatal cases have been those in which one or more curettages preceded hysterectomy by a considerable interval. (300 cases reviewed by Vineberg, Hitschmann and Christofollette).

Differential diagnosis

Incomplete infected abortion most frequently confused. Degenerating myomas, sarcoma, and at times fundal carcinoma may simulate chorionepithelioma, but absence of pregnancy and typical histology usually make diagnosis clear.

Hormone tests

The Aschheim-Zondek test, used first in a case of chorionepithelioma by Robert Meyer and Roessler, along with the more recent modifications is of value. Freedman modification is well adapted to the purpose. Normal pregnant urine at three months yields about 5 mouse units of anterior pituitary hormone per cc., while moles may yield 100 M.U. per cc. and chorionepithelioma may yield as much as 70 M.U. per cc. There seems to be some correlation between size of tumor mass and concentration of hormone in urine. Freedman test should be negative two weeks after normal pregnancy, (frequently in 8 days), slightly longer after an abortion, and by 8 weeks after expulsion of a mole. Increasing concentrations of hormone after these intervals, as indicated by quantitative Freedman tests, practically

establishes the diagnosis of chorionepithelioma, (50 cases followed up until '33 by Mazer and Ediker).

Prognosis

Death within one year is the rule, although cures by curettage have been reported (Velit, 8 cases). A few cases have recovered after incomplete removal (Ewing, 7 cases). Neither pulmonary nor vaginal metastasis seem to imply increased mortality. One case had excision of three labial tumors with spontaneous regression of a fourth (Rockefeller). Schmauch reports recovery of 13 cases in spite of vaginal metastasis.

Teacher's series:

Those after mole	53.4%	fatal
" " abortion	66.1%	"
" " full term	79.6%	"

Of 100 cases in the same author's series, 37 died; of the living 63, 32 were well at 6 months, 24 at one year, 13 at 2 years and later.

Following Ewing's classification, syncytioma is relatively benign, while chorio-carcinoma is practically invariably fatal. (10% of cases of the whole group are relatively benign, Novak and Koff).

Therapy

Complete evacuation of all moles as prophylaxis and immediate pan-hysterectomy if chorionepithelioma is present. The use of small doses of irradiation in suspected cases is deprecated because local danger signals are masked.

Therapy with x-ray and radium holds considerable promise of permanent results in selected cases. Present statistics are limited due to the rare nature of the tumor.

Impressions

1. Histology of the tumor was first described in 1892 by Sanger. At this

time, it was called a sarcoma. The present name of the tumor was given to it in 1898.

2. Chorionepithelioma is very rare. In 1919, 571 cases were collected from the literature. In 76,000 pregnancies, there were 80 moles and 6 chorionepitheliomas. This is an incidence of one chorionepithelioma in 12,813 pregnancies and one tumor in 13.3 moles. The incidence of chorionepithelioma in hydatiform mole is said to be less than 5%.

3. About 99% of the tumors follow pregnancy and the other 1% has a doubtful history.

The character of the previous pregnancy in 455 cases was hydatiform mole 45%, abortion 30%, labor at term 21%, ectopic pregnancy 2.5%. The relatively high percentage of unsuspected moles in cases of abortion suggest that the apparent origin from abortion may actually have a mole as the basis.

4. In one series of 90 tumors, the average number of pregnancies was 4.2. The percentage of the tumors following the first pregnancy is about 5%, following the second about 15%, after third or fourth 28%, and above fifth 38%. This percentage is approximately the same in other groups reported.

Average age of incidence is 33 years which is the average age of child-bearing. Only a few cases have been reported above 50 years or under 20. This seems to follow approximately the child-bearing age of distribution.

5. Tumor may occur synchronously with pregnancy or follow after an interval of 31 years. Probably the unusually long periods of latency are erroneous and the tumor is on the basis of an unknown abortion. Latent periods over 3 years are uncommon. The tumors have been found at the time of evacuating the moles.

6. The tumor is almost always located in the uterine wall but ectopic locations have been reported. There have been 22 cases of tumor in pregnant tubes and

rare tumors have been reported in the vaginal wall, non-pregnant tubes, broad ligaments, retroperitoneal tissue, kidneys and in teratomas.

7. Uterus is almost always large. The tumor is present either in the cavity or in the wall or scattered throughout. Perforation sometimes occurs. Hemorrhage, suppuration and necrosis within the mass is common. Histologically, the tumor is composed of an overgrowth of the Langhan's cells, syncytium and connective tissue. The Langhan cells occur in masses or plates. The presence of these masses of cells in the absence of villi is characteristic of the tumor. There are no clear-cut divisions into tumor types. The chorionadenoma and chorion-carcinoma and a syncytioma have been described. The distinction is on the basis of proportion of syncytium and stroma.

8. Metastases are distributed by the blood. The invasion of the tumor into the blood sinuses of the uterus is very common and characteristic. The sites of predilection are lung, vagina, liver and vulva.

9. The changes in the glands of internal secretion are of interest. In the ovary, there are multiple (often bilateral) corpus luteal cysts. The incidence of these cysts is about 10% in chorionepitheliomas, about 60% in hydatiform mole. Probably more careful section of ovaries would show a higher incidence of these luteal changes. Spontaneous regression takes place on removal of the tumor. In the pituitary, changes similar to those in pregnancy take place.

10. The diagnosis on physical examination can be only made late in the course. Hemorrhage at any time following hydatiform mole or persistent hemorrhage following abortion is suspicious. Metastatic nodules in the vaginal wall are pathognomonic. For early diagnosis, uterine exploration is essential. One author recommends abdominal hysterotomy in these instances. Trophoblastic tissue without villi occurring shortly after some form of

pregnancy is the usual criteria for histological diagnosis. In the presence of villi, the diagnosis is in doubt.

11. Incomplete infected abortion, degenerating myomas, sarcomas and fundal carcinomas may simulate chorionepithelioma.

12. Hormone tests are of great value. The number of mouse units in normal pregnant urine is about 5, in hydatiform about 100 and in chorionepithelioma as much as 70 M.U. may be found. Apparently, there is some correlation between size of the tumor and concentration of hormone. The Freedman test should be negative about 2 weeks after a normal pregnancy and about 8 weeks after expulsion of a mole. Increasing concentration of the hormone after these intervals practically establishes the diagnosis of chorionepithelioma.

13. Spontaneous recovery or recovery after incomplete removal has been occasionally reported. In a group of 100 cases, 37% died and of the 63% living, 32% were well 6 months, 24% one year, and 13% from two or more years.

14. It is considered that panhysterectomy is the treatment of choice as soon as the diagnosis can be established. The use of small doses of irradiation in suspected cases is depreciated because local danger signals are hidden. The use of radiation in full doses as therapy is considered to be promising but statistics are still limited due to the few cases reported.

Abstract by R. Schwegler.

III. 1933-1934

Twenty-eight Staff Meetings were held during 1933-34 (including today). The meetings started October 5, 1933. Bulletins have been issued for all except one which was an exhibition of medical movies. One meeting was held in conjunction with the convention of the Association of American Medical Colleges. The total attendance to date is in excess of 3,000. For the past season, 275 bulle-

tins have been printed each week and more than 100 are sent out by mail to individuals in various parts of the country. As in the past, the cost of publication has been borne by the Citizens Aid Society, a group of public-spirited Minneapolis citizens. It is difficult to judge the progress we have made (if any). Subject material is always the most difficult part of program planning, but those who attempted to arrange the programs this year have appreciated your cooperation and support. Partial success attended efforts to get the audience to take a more active part in the meetings. An attempt to inform the various members in advance of the content of the book was worthwhile.

An effort was made to experiment with the programs and valuable experience was gained in this way. We apparently know what you like a little better than we did at the beginning of the year. We have tried to keep before us the fact that we are a teaching hospital and that we have a definite obligation to teach all, including the younger members of our group. This may be the reason that the plan has not appealed to some of our senior members, who have not been able to appreciate this viewpoint.

In closing our meetings, we thank you all for the help you have given us. Especially do we appreciate those who made an effort to attend regularly, stay during the meetings and take a part either by giving their undivided attention, asking questions, or responding when invited to discuss the material. If the staff feels that this type of meeting is worthwhile, they will be resumed in the fall when school opens. We hope you all have a pleasant summer and return rested from your vacations, ready to take up again the many problems which perplex our profession.

William A. O'Brien, M. D.
Rudolph W. Koucky, M. D.