VOL. II THURSDAY, JANUARY 22, 1931 NO. 16
THURSDAY, JANUARY 29, 1931 NO. 17

GENERAL STAFF MEETING
UNIVERSITY HOSPITALS

CONTENTS
JANUARY 22, 1931

JANUARY 29, 1931

SPECIAL MEETING January 22, 1931.

WHY MINNESOTA NEEDS A PSYCHOPATHIC HOSPITAL, Franklin G. Ebaugh, M.D., Denver.

Franklin G. Ebaugh, M.D., Director Psychopathic Hospital of Colorado, distinguished young disciple of Adolph Meyer of John Hopkins, visited the University Hospitals, addressed staff at special breakfast at 8:30 A.M., Medical students in Anatomy amphitheater at 10 A.M., State-wide committee for Psychopathic hospital, Citizen's Aid Bldg., at 12 noon, and State Legislature (combined meeting of House and Senate) at 2:30 P.M. Attended private dinner of friends in evening, left for Colorado sunshine on late train. Introduced by Dr. A. S. Hamilton, of Minnesota at Staff meeting.

Highlights: Colorado Psychopathic Hospital is part of Medical School and Colorado General Hospital. Patients are treated as a whole. Close relationship exists between clinical psychiatry and clinical medicine. Results of treatment in mental cases as good as medical and surgical cases (Bond) compared 100 cases from both groups after 10 years. Psycho-neurosis is a difficult question: which should be hospitalized and which should not? There is a great deal of psychology in the attitude you take toward your patient.

The hospital undertakes psychiatric therapy. In addition it is part of a state-wide organization which includes an out-patient department and community clinics. The hospital is organized for the following purposes: 1. treatment and prevention of mental disorders; 2. Teaching of medical students, undergraduate and graduate nurses, graduate students in medicine, social service workers and others; 3. Research is also carried on; members of the staff appear on local and national programs and get out bulletins for the profession of the state. Average 800 admissions per year with average stay of 31 days. 60% or more are restored to community life; follow-up has been made in about 90% of the cases. 1. The treatment is first physical, (exhaustive laboratory studies are made); 2. Mental disorders. Paretics are being treated with malaria, and with non-specific treatment. 40% of this group are home and working. Home doctor sends spinal fluid every month or so for check-up. 3. Psycho-therapy - 70% of diseases of the functional type. When the patient understands the origin of his symptoms (insight) they rapidly improve in many instances. Conferences are held with relatives about the treatment.

The outpatient clinics: 1. A follow-up clinic for those who have been treated. 2. A place for those showing early signs; 3. Child guidance cases. The Community clinics are organized throughout the state in conjunction with the County Medical Societies and are financed by the local community. Some 400 children are examined yearly. In addition, the staff have an opportunity to study the home surroundings of many of their patients.

Statistics show that 276 persons out of every 100,000 in Minnesota are afflicted with some sort of mental disorder. This is slightly higher than the average. In Colorado the ratio of mentally disordered is 225 to every 100,000 which decrease is attributed to the work of the Psychopathic Hospital. In this country one person out of every 325 is in some sort of institution for mental trouble. There is a total of 400,000 persons in institutions, and this number, including readmissions, is increasing at the rate of 100,000 every year. About one half of 15,000 yearly suicides, and about one half of 35,000 attempted suicides each year could be attributed directly to mental disorder, an unfortunate situation which a psychopathic hospital could alleviate to a large degree. 20% of our jail inmates are mentally ill and only 30-35% of the patients admitted to the state hospitals ever recover. A Psychopathic hospital would vastly improve this ratio. The proposal was put to a popular vote in Colorado, the measure was carried by a 93% majority. The Denver Hospital originally cost $350,000 and has a monthly operating expense of about $7500. Part of the admitted patients pay their whole cost and many of them are part pay cases (about the same ratio as our patients).

Dr. Ebaugh, suave and smiling, pleased all, made excellent impression, advanced the cause of our Hospital. Our thanks are due him for assistance rendered. He will always be a welcome visitor at the University Hospitals. May his tribe increase!

I. ANNOUNCEMENTS: January 29, 1931.

1. Clinico-Pathological Conference - Acute Confluent Bronchopneumonia, illustrating method of typing and correlation with clinical and pathological findings - Friday, January 30, at 11 A.M. Todd Amphitheater.

2. New Pediatric Clinic for Allergic patients. Wanted - Eczema, hay-fever and asthma, with special emphasis on the latter. Only cases below the age of 15 will be handled. Time is Tuesday morning, from 10-12 in the Pediatrics Out-patient division.

3. Reportable Diseases. Make a card for each case of anterior poliomyelitis, cerebro-spinal meningitis, chicken-pox, diphtheria, erysipelas, epidemic influenza, measles, paratyphoid fever, pneumonia, scarlet fever, small-pox, traucoma, tuberculosis, typhoid fever, whooping cough. Additional information is required for patients who have smallpox and chicken pox, if 16 years of age or over. These cards may be obtained from Miss Gilman or Miss Gunn. Syphilis and gonorrhea require a special report in the form of a small booklet which is given to the patient and the card torn off the back and mailed in. We have been criticized for our negligence in reporting venereal disease, especially among the patients in the hospital. These reports must be made while the patient is still in the hospital and cards may be obtained either from Miss Gilman or Miss Gunn.

4. Twentieth Anniversary of Elliot Memorial Hospital

"Originally American medical colleges were institutions giving didactic instruction almost exclusively. Clinical instruction, apart from lectures, was in the form of large amphitheater clinics, in which the student had practically no opportunity for the examination of patients. Few medical schools had hospitals of their own or any arrangements under which they could control clinical material. With the founding of John Hopkins Hospital Medical School, and as the need for practical training and real contact between student and patient became better realized, there arose a strong movement for University hospitals. In 1905 the opportunity came to Minnesota. Through Mr. Walter J. Trask, executor of the will of Mrs. Mary Elliot, widow of Dr. Adolphus F. Elliot, an offer of money for erection of a hospital as a memorial to Dr. Adolphus F. Elliot was made to the Board of Regents. October 5, 1905, the gift was accepted but executor was asked to extend the time of acceptance until the same should have been submitted to, and receive the approval of, the legislature. On April 2,1907, the legislature passed the act approving the action of the regents in accepting the donation of $113,000 from Mr. Trask for the erection of the hospital and of a donation from a group of citizens of $50,000 (the act reads $50,000 but the sum was really $42,000) for the purchase of a site. The building of the hospital was delayed for various reasons, the most important being, apparently the choice of a site. Meanwhile the funds were accumulating with interest. The need for a hospital, however, was so great, that the regents consented to a small start in a residence on Washington Avenue. Here the University Hospital first opened in March, 1909, the legislature of that year having made an appropriation of $5,000 for the support of the hospital during 1909 and 1910, and $15,000 for the year 1910-11. The present Elliot building was dedicated September 5, 1911. Its capacity was about 108 beds. Dr. L. B. Baldwin was appointed superintendent June 7, 1910. In 1911 the legislature made an appropriation of $50,000 for the construction of a service building. The building was completed in 1913. The

kitchens and other utilities previously housed in the Elliot building were transferred to the service building and the capacity of the hospital proper increased about 84 beds or to a total of 192 beds." From date concerning the hospital and Medical school of the University of Minnesota and other state universities. Lotus D. Coffman, President. July 26, 1926.

It will be seen that September 5, 1931 is the twentieth anniversary of the dedication of Elliot Memorial Hospital. A suitable program should be arranged for this occasion and the staff's attention is called to it at this time.

5. Dr. Henry Michelson -
of Minneapolis is president-elect of the Chicago Dermatological Society. This unusual honor was conferred on the head of our department because of his active interest and leadership, in attending the regular meetings of this organization for some time. We congratulate the Chicago Dermatological Society for its wise choice, and extend our best wishes to Dr. Michelson for a successful year.

6. Visitor -
Mrs. George Chase Christian, representing the Citizen's Aid Society, was a most welcome visitor, at the hospital last week. While here she interviewed the various men and women interested in malignancy. Through the activity of Mrs. Christian a considerable sum of money was given to the Cancer Institute this year for education, fellowships, assistants and clerical help. The hundreds of cancer patients who have received expert care join the members of the staff in expressing to this splendid woman our thanks for her unfailing interest and practical assistance at all times.

II. ABSTRACTS - TUMORS OF BRAIN

1. DIAGNOSIS: DOWMAN, C. E. and SMITH, W. A. INTRACRANIAL TUMORS. A Review of 100 Verified Cases. Arch. Neur. Psych. 20:1328, 1928.

1. Types: 63 gliomas, 11 endotheliomas, 10 chiasmal tumors, 6 acoustic neurinomas, and 10 other rare tumors.

2. Age: 13 of the 18 cerebellar tumors were under 20 years.
8 of the 10 frontal tumors were over 30 years.

3. Average Duration of symptoms before diagnosis (27.5 months).

4. First Symptoms:

Increased intracranial pressure	57%
Focal lesion (chiefly Rolandic and cerebello-pontine tumors)	43%
	100%

5.

Neurological Localization, made in	75%
With aid of ventriculograms	89%
	-11%

6. Symptomatology
   1. Headache - (81%) Dull, steady ache to severe intermittent neuralgic pain. Cerebellar headaches unrelieved until after operation. Initial symptom (37%).
   2. Vomiting -(54%). Projectile (11%). Initial symptom (2%).
   3. Visual disturbances -(53%). Complex visual hallucinations occurred in one tumor of temporal lobe.
   4. Convulsive Seizures -(39%) Tonic seizures in (2%). (Both subtentorial lesions).
   5. Mental Disturbances -(31%).
   6. Vertigo -(29%).
   7. Anosmia -(10%).

7. Localizing Value:
   1. Headaches - none. 2. Vertigo - none. 3. Convulsive seizures (54%). 4. Mental disturbances -(the earlier the development, the more anterior the growth). 5. Anosmia (of value in tumors overlying cribriform plate).

8. Diagnostic Aids:
   1. Eyegrounds: papilledema (66%), optic atrophy without choking (14%), normal fundi (14%).
   2. Visual fields: localizing value (16%).
   3. Diplopia: paralysis of 6th nerve occurred in one tumor of pons.
   4. Blood pressure increase (and slowing of pulse) only in terminal stages of medullary compression.
   5. Roentgen-ray studies of skull, localizing values in (21%). Ventriculogram of essential value in localization in (14%).
   6. Spinal fluid: no value as far as diagnosis is concerned (4 positive Wassermanns - no gummata found).

9. Duration of Life of 100 cases. 24 were living. Difficult to express because of variability and type and location.

COMMENTS: Note large number showing increased intracranial pressure (57%) and duration of symptoms before diagnosis (27.5%). Headache is apparently the common presenting symptom, and when associated with vomiting and visual disturbances, deserves serious consideration. Mental disturbance was less frequent (31%), in primary tumors than in metastatic tumors (more than 50% in another series). Convulsive seizures, as a symptom, are of greatest localizing value.

2. CLASSIFICATIONS: Bailey, P. and Cushing, H. J. B. Lippincott and Company, 1926, 1st edition. An attempt to correlate tumors of the vlioma group on a histogenetic basis with prognosis. Lesions commonly grouped together as gliomas represent about 40% of all intracranial neoplasms. They exhibit a bewildering variety of microscopical structure and existing classifications have served to do little more than add confusion to a complicated subject. The authors ask the following questions:

1. What is the basis of the structural variability shown by the gliomatous tumors?
2. Has the histological variation any clinical significance?
3. Does it account for the unexpectedly long survival period in some?

More than 400 verified gliomas are studied, including 167 necropsy specimens, collected in part at John Hopkins Hospital and later at Peter Bent Brigham Hospital, covering a period of 21 years, January 1, 1903 to January 1, 1924.

Histogenesis of the Brain: Cell types

1. Medullary epithelium
2. Medulloblast (indifferent cells)
3. Pineal proparenchyma
4. Pineal parenchyma
5. Primitive spongioblast
6. Ependymal spongioblast
7. Ependyma
8. Bipolar spongioblast
9. Unipolar spongioblast
10. Astroblast
11. Protoplasmic astrocyte
12. Fibrillary astrocyte
13. Oligodendroglia
14. Apolar Neuroblast
15. Bipolar neuroblast
16. Unipolar neuroblast
17. Multipolar neuroblast
18. Neurone.
19. Microglia
20. Choroidal epithelium

Classification of Gliomas:

That gliomas are rarely found to be composed of a single type of cell should be no cause for surprise (Note: this is the chief criticism of the authors' attempt at classification). Because of this the following types are considered

at this time:

1. Medullo-epithelioma
2. Medulloblastoma
3. Pineoblastoma
4. Pinelaoma
5. Ependymoblastoma
6. Ependymoma
7. Neuro-epithelioma
8. Spongioblastoma (a)protoplasmaticum (b) unipolare
9. Astroblastoma
10. Astrocytoma (a) protoplasmaticum (b) fibrillare
11. Oligodendroglioma
12. Neuroblastoma
13. Ganglioneuroma
14. Papilloma chorioideum

412 Gliomas, Unclassified and Classified:

1. Verified by cystic fluid alone		48
2. Excluded because differential study impossible		56
3. Unclassified gliomas of optic chiasm, pons or midbrain (Optic chiasm 11, brain stem 18).		29
4. Excluded for other reasons		27
1. Blood vessel tumors	5	
2. Atypical gliomas	17	
3. Transitional forms	5	
5. Classified		254

Prognosis as to cell type. The average survival period for the tumors of different histological types:

L - average survival in months from onset of localizing symptoms.
P - average survival in months from onset of pressure symptoms.
E - average survival in months from earliest known symptoms.
A - average of L, P, and E.

	Cases	L	P	E	A
1. Medullo-epithelioma.....	2	9	5	10	8
2. Pineoblastoma.....	3	?	12	12	12
3. Spongioblastoma multiforme...	77	12	10	13	12
4. Medulloblastoma.....	29	15	18	19	17
5. Pinealoma.....	5	20	13	22	18
6. Ependymoblastoma.....	5	25	15	17	19
7. Neuroblastoma.....	3	30	21	24	25
8. Astroblastoma.....	13	20+	33+	32+	28+
9. Ependymoma.....	7	27+	32+	36+	32+
10. Spongioblastoma unipolare....	9	48+	45+	45+	46+
11. Oligodendroglioma.....	9	82+	42+	75+	66+
12. Astrocytoma protoplasmaticum.	53	75+	58+	67+	67+
13. Astrocytoma fibrillare.....	39	87+	81+	89+	86+
	254				

Not represented in list - papilloma chorioidem 0
neuro epithelimoma 0
ganglioneuroma 0

Common Types

1. Spongioblastoma multiforme: (77 out of 254 cases)

Unfavorable group representing about one third of all classified cases. Also the most malignant. Tumors usually recur after surgical removal. Lesions infiltrate and behavior has given to it the name gliosarcoma. When first explored the surface of the tumor is misleading and enucleability is thought to be comparatively easy. When an attempt is made, however, the growth is found at a depth and merged with the normal tissue without any line of demarcation. They are tumors of middle life, and occur from 12 to 69, average age 41, predominates in the 5th decade, (27 out of 77). Almost invariably occur in the cerebral hemisphere, only 2 cases having been found in the cerebellum. They are less apt to cause serious complications due to stasis, but paralysis and ultimate death

may be due to their bulk, alone or associated with cerebral edema. Do not form metastases and rarely, if ever, inoculate the meninges. They spread widely from the point of origin, and given room, may attain an enormous size. They invade extracranial tissues when the lesion lies subjacent to them after decompression. The growth in one case extended down into the patient's neck, behaving very much like a sarcoma. Operative procedures, however radical, or any other form of treatment have done little more than prolong life, save vision and alleviate headaches for an average of a few months. There have been many postoperative fatalities in this series. All but five were operated upon one or more times. In the five unoperated cases, the average duration of life from the onset of symptoms was only three months, the average period was twelve months for those surgically treated.

2. Medulloblastomas (29 out of 254 cases).

Rapidly growing, soft, malignant tumors which not infrequently, when they reach the leptomeninges, disseminate themselves through the subarachnoid spaces. They occur with greatest frequency in the midline of the cerebellum in childhood, although similar tumors may be found in the cerebrum. They are probably no less malignant than the spongioblastomas just described, their more favorable position being due to the influence of four cases which were operated on. The average age of the 25 cerebellar cases in the series was 10 years, the youngest 2, the oldest 38. 16 of the cerebellar cases occurred in the first decade of life. They have a common point of origin over the roof of the 4th ventricle, and until recent years have been considered beyond the possibility of surgical removal. Survival period without operation 2 cases (3 months). The average is 6 months before operation and 6 months after, a year in all. Radiation appears to have considerable effect in deterring the growth of the undifferentiated cells of the lesion. Suboccipital decompression may give some relief.

3. Protoplasmic Astrocytomas: (53 out of 254 cases.)

81 operations on 53 patients; 5 postoperative fatalities. Possible may be due to lessened tendency for cerebral edema to develop. Average age 29 years, cases being evenly distributed over the first six decades. Many have shown definite local or moderate pressure symptoms for from 1-10 years. The youngest case is 23 months, the oldest 58 years. 17 were cystic. They are usually tumors of the hemispheres, cerebral or cerebellar, 15 of the cerebellar cases were, with one exception, young people of an average age of 13 years. In the cerebrum 11 were temporal, 10 frontal and 8 paracentral with the rest of them scattering, the average age of 37 patients on admission being 35 years. This may be interpreted as an indication of greater longevity on the part of these tumors than the authors had thought possible. It suggests that cerebral tumors may have existed since childhood and cerebellar tumors of the same type give earlier symptoms because of location. Many cases described as gliomatous cysts should be included in this type, but not all are cystic.

4. Fibrillary Astrocytomas: (39 out of 254 cases)

The most slow growing and benign of all tumors. Average age on admission 23 years. Average age at onset of symptoms about 3 years younger. Youngest case 4, oldest 48. The young cases tend to be cerebellar. Average duration of pressure symptoms in whole series 26 months. Local symptoms 20 months. Average postoperative duration of life in 39 cases has been 54+ months. If we exclude the cases that died after operation, the survival period averages 70 months. Tumors of this sort originating in the cerebrum are less favorable than those found in the cerebellum. Many undergo cystic change, but a suboccipital operation, abandoned merely as a decompression after the disclosure of a subcortical cerebellar cyst, leads to an unexpectedly long survival with a reasonable assurance one can count upon the presence of a fibrillary astrocytoma, and should a secondary operation be calledfor, a favorable outcome may be anticipated.

Conclusions:

1. Cerebral gliomas represent about 42% of all intracranial new growths in a series comprising something over 1,000 examples, and have heretofore been regarded generally as hopelessly malignant tumors.
2. Many patients with tumors of this sort survive for unexpectedly long periods of time after incomplete extirpation of lesion. This was the reason for the reclassification of the group.
3. Tumors whose cells reproduced the less differentiated cells in the developing central nervous system are more actively growing than are the ones composed of more highly differentiated cells.
4. Half of the reclassified gliomas, however, are composed of highly differentiated cells, which apart from the mischance of their occupying an inaccessible position in the brain, or one which leads to serious secondary complications, may be regarded as comparatively benigh lesions.
5. The successive groups of classified gliomas arranged in series, show a variation from those which have a few months of life to survive when properly treated 10 years or more. The length of survival period goes hand in hand with the increasing degree of differentiation of the neoplastic cells.

III. CASE REPORT - SILENT EPENDYMOMA - SUDDEN POSTOPERATIVE DEATH, CHRONIC ATROPHIC ARTHRITIS, TENOTOMY.

Comment: Ependymomas and ependymoblastomas usually occur in the mid-cerebellar region, in about the same situation as the meningoblastomas. They are firm, pale and sometimes nodular growths, and have a tendency to project into preformed spaces. They arise from ependymal cells and have a characteristic, well differentiated structure showing characteristic blepharoblasten. They may arise from the walls of the 4th ventricle or the septum lucidum. There is slight tendency to malignant change, and produce symptoms because of location. One patient living 13 years after tumor was discovered. (Bailey & Cushing). Sudden death (post-operative) occurred in this case because of increased intracranial pressure.

The case is that of a middle aged white female, age 46, admitted to the University Hospitals 11-2-29 and discharged 3-26-30 (117 days). Readmitted 12-29-30 and died 1-10-31 (12 days). Total hospitalization 129 days.
Jan. 1925 - Weakness and slight malaise. Went to the General Hospital Dispensary where physical examination was negative except for marked pyorrhea. Dental treatment advised.
May 8, 1925 - Had 14 teeth removed at one time. Felt well for 3 weeks.
May 29, 1925 - Gradual stiffening of joints began at right knee and ankle. Large lumps developed on knees. Painful on motion. Later stiffness in arms, elbows, shoulders, wrists, fingers and cervical spine respectively. Treated at the Gen. Hosp. without results.
1925 to 1929 - Treated by faith healer who said that she had "paralysis of the blood". Treatment consisted of holding hands and allowing electricity to flow from healer to patient. Tried a great number of patent medicines. Treated at Robbinsdale from Feb. to July 1928.
1926 - Began to act somewhat childish and silly.
1927 - Urinary burning and frequency, progressively becoming worse.
Sept. 1929 - Urinary burning and frequency decidedly worse. Patient incontinent. Consulted physician who find urine full of pus. Basal metabolic rate -14.
Nov. 22, 1929 - Admitted to the University Hospital complaining of stiffened, painful joints, and urinary frequency, burning and incontinence.
Past history - Appendectomy. Resection of ovary and uterine suspension in 1910. Histerectomy in 1920.
Family history - No mental history in family.
Marital history - First married in 1900 (when 15 yrs. old). 1 daughter living. Husband died in 1910. 2 youngest children died at birth. Remarried 8-19-24 to

a blind worker, against the advice of the Society of the Blind. Was very anxious to marry him.

Physical examination - Well nourished, middle aged female, lying in bed with painful, stiff joints. Eye grounds normal (intern.) Tonsils present. B.P. 108/60. Midline scar from symphysis to umbilicus. Fingers on both hands deformed and painful on motion. Fingers of left hand flexed rigidly. Moderate limitation of motion of elbows, shoulders, hips, knees and ankles. Pelvic examination shows absence of corpus. Urine 1018. Numerous WBcs. Hb. 72%, Rbcs 4,500,000. WBcs 11,750. Pmns 67, L 26, Eos. 5, M. 2. Group 4.

Wassermann - State Board and Larson negative.

X-ray - Skull is small. There is a considerable depression of the middle cranial fossa. The sella turcica could not be clearly visualized because of inability of patient to cooperate. Appearance suggests a growth anomaly. Plates of the spine, shoulders, elbows, wrists and hands show marked atrophic arthritis.

Opinion - Atrophic arthritis. Congenital deformity of the skull. Pulse 92, Temperature normal. Respirations normal.

11-2-29 - Complains of pains in the joints and inability to control bladder. Codeine sul. gr. 1. Luminal gr. 1-1/2. Sodium salycilate grs. XV t.i.d.

11-4-29 - Fells better. Back very red and inflamed. Calves of legs peeling. Medical consultation suggests search for foci, typhoid therapy and physiotherapy.

11-5-29 - Ultra violet and massage therapy, every other day. Fells better.

11-6-29 - Basal metabolic rate -11. Complains of pain. Codeine gr. 1, luminal gr. 1-1/2.

11-8-29 - Uric acid 7.1 mg.(?). X-ray of esophagus shows it to be normal. Root of left lateral incisor removed.

11-10-29 - Medical notes state inability of patient to hold urine, thought to be primarily functional. No urinary findings of cystitis. Urine negative. Hb.71%, RBcs 4,200,000. WBcs 7,600. Pmns 71%, L 21%, Eos. 3%.

11-12-29 - X-ray - showed only moderately dense shadow of gallbladder which did not change from time to time, and showed greater concentration after a fatty meal. Opinion - Probably pathological gallbladder. Cystoscopis consultation answered. Blood calcium 11 mg. Urine negative. Pulse to 90. T. normal.

11-14-29 - Feels good. Temperature and pulse normal. Cystoscopy revealed normal bladder except for a large amount of mucus. Urethral openings normal. Clear urine, both sides. Opinion - Bladder is normal except for unusual amount of mucous. Urine negative. M.S. gr. 1/4 for pain.

11-20-29 - Intravenous typhoid begun.

Time		9:45 A.M. Injection	10:15	10:45	11:15	11:45	
Rt. Ankle	32.3		27.9	29.2	29.1	27.7	28.7
L. Ankle	32.3		28.9	30.2	28.9	29.1	29.6
R. Wrist	31.0		33.6	33.0	32.4	35.0	35.5
L. Wrist	29.1		32.9	33.6	32.7	34.4	33.3
Abdomen	35.4		35.4	36.0	36.5	36.7	36.7
Room T.	21.0		19.5	19.5	20.	20.	19.5
By Mouth			99.6	101.0	101.4	101.4	101.3

After this the patient showed marked improvement in symptoms as she moved about in bed with remarkable ease. Urine negative. Stool examination. Formed, hard brown stools from undigested food particles. No blood, no parasites. Urobilin normal.
11-23-29 - Passive motion t.i.d. Nasal oil t.i.d.
11-27-29 -

SKIN TEMPERATURE

Injection at	2:35 P.M.	3:05 P.M.	3:35 P.M.	4:05 P.M.	4:35 P.M.
L.Ankle	30.2°C.	31.6°C.	31.8°C.	30.5°C.	28.5°C
R.Ankle	31.2	32.1	32.2	30.8	28.6
Abdomen	34.4	35.4	35.3	36.1	35.3
L.Wrist	34.1	34.6	33.6	32.8	34.7
R.Wrist	34.5	33.1	31.8	32.1	31.2
General (Mouth)	99.0°F	99.0°F.	99.4°F.	100.1	99.8
Room	23°C.	23° C.	23° C.	23° C.	23.° C.
Relative Humidity of Room		34%			

After intravenous typhoid injections, she showed marked improvement in symptoms.
11-29-29 - Hb. 66%, RBcs 3,520,000. WBcs 8,800.
12-2-29 - Stool examination - Undigested food particles. No blood. No parasites. Urobilin normal.
12-12-29 - Intravenous typhoid injections.

SKIN TEMPERATURE

Injection at	2:05 P.M.	2:35 P.M.	3:05 P.M.	3:35 P.M.	4:05 P.M.	4:35 P.M.
L.Ankle	31.5°C.	32.9°C.	30.7°C.	30.8°C.	30.7°C.	30.2°C.
R.Ankle	31.6	31.1	31.4	31.1	30.9	31.3
Abdomen	34.1	34.5	34.6	35.3	35.5	35.2
L.Wrist	31.5	31.9	31.9	33.3	33.4	34.1
R. Wrist	31.0	32.5	33.5	34.1	36.0	35.7
General (Mouth)	98.4 F.	99. F.	100.4 F.	101.6 F.	101.8 F.	101.8 F.
Room	22.5°C.	23.0 C.	23.0 C.	21.5 C.	21.5 C.	21.5 C.
Relative Humidity of Room		31%				

Marked improvement in symptomotology noted. Urine negative.
12-14-29 - Accepted as favorable for surgery. Feels good. P. and T. normal.
Blood - Hb. 65%, RBcs 3,200,000, WBcs 6,900.
12-20-29 - Complains of cold. Given elixir terpine hydrate with codeine, 1 dram every 3 hours, and hot Dobell's gargle every 4 hours. T. and P. normal.
1-3-30 - Operation - Midline lower abdominal incision. Numerous adhesions of small bowel to anterior abdominal wall at site of previous appendectomy were found. Incision made into the peritoneum to medial side of rt. ureter. Ureter retracted laterally and vena cava medially. 2-1/4" of the right sympathetic trunk was removed, including 2 sympathetic ganglia. Similar incision was made on the left side between the aorta and the left ureter. 2-1/4" of the left sympathetic trunk was removed, including 2 ganglia. Hypodermoclysis 2000 cc. Proctoclysis 1000 cc. Postoperative condition fair. P. to 126, T. normal. B.P. 70/50. 500 cc. of blood transfused. B.P. 130/80 after this. Pathological report showed normal ganglionic nerve tissue.
1-4-30 - 2000 cc. hypodermoclysis. Hyperventilated 4 times daily. Complains of pains in the legs. P. to 124. T. to 100.4. Urine - negative.
1-5-30 - Rests comfortably. Voids. 1000 cc. proctoclysis. B.P. 90/60. No

nausea, vomiting or distention. Condition fairly good. P. to 120. T. to 100.4. Nasal lavage - 50 cc. greenish fluid returned. No pain.
1-6-30 - Feels more comfortable. Morphine gr. 1/4. 2000 cc. proctoclysis. Hypodermoclysis 1000 cc. Normal saline. P. to 140. T. to 100.
1-7-30 - Condition good. Has had some difficulty in controlling bowels but this is improved. Able to move legs better than before operation. P. to 120. T. to 99.8. Proctoclysis 1000 cc. Hypodermoclysis 1000 cc. normal saline. Morphine gr. 1/4. Incontinent.
1-8-30 - Feels good. No pain. P. 104. T. 99. Urinary incontinence noted.
1-9-30 - Involuntary defecation and urination. Complains of pain in the right hand and arm. Relieved by hot water bottle. Tr. of opium m.X, t.i.d. for 2 days. Morphine gr. 1/4. Dry dressing applied. P. 94. T. 99.4. Still some urinary incontinence.
1-10-30 - Bowel and bladder control established. Has some pain in the right elbow and both knees. Morphine sulphate gr. 1/4 for pain. Every other stitch removed. P. to 130. T. 99.
1-11-30 - Complains of pain in both knees and right arm and hands. Sodium salycilate gr. x 4 times daily started. Dry dressing daily. P. to 104. T. to 100.6.
1-12-30 - Stitches were removed. No complaints. P. to 108. T. 100.
1-13-30 - Complains of cough. Has involuntary defecations. Pain in extremities and rt. arm. Dry dressing. Some separating of the wound at the lower end with considerable ser-sanguineous drainage. P. to 112. T. 99.
1-14-30 - Feels good. Several involuntary urinations. Boric acid solution. Dry dressings applied to wound. T. 99.6.
1-15-30 - Continued physiotherapy treatments as before operation. No pain. Boric acid solution and dry dressings applied to wound. P. 78. T. 99.4.
1-17-30 to 1-23-30 - Complains of pain in back. Codeine gr. 1, luminal gr. 1-1/2 P. to 100. T. to 99. Complains of pains in the legs. Dichloramine T daily to the wound.
1-23-30 - Sodium acid phosphate gr. X. Urotropin gr. X, each 4 times daily. Ammonium chloride gr. X t.i.d. T. and P. normal. The bladder was irrigated with boric acid solution followed by 1% mercurochrome.
1-24-30 - Up in a wheel chair. Feels strong. P. 100.
1-26-30 - Walked a little. All joints are improved after the operation. P. 80. T. normal.
1-27-30 - Mercurochrome instillation changed to silver nitrate 1%. P. - T. Normal.
1-29-30 - Complains of severe pain in the bladder. Heat applied daily to the perineum.
2-11-30 - Urine is negative. Walks with help. P. and T. normal.
2-12-30 to 3-26-30 - During this time the patient improved very rapidly and is able to walk around with help. No pain. T. and P. remained normal. Urine on 5 occasions negative.
3-26-30 - Discharged from the hospital.
9-26-30 - Husband wishes to desert patient by divorcing her. Social worker states patient has been untrustworthy, especially in domestic matters.
12-29-30 - Readmitted to the University Hospital complaining of overflexion of the knee joints. Physical examination at this time was negative except for flexion of both knees that could not be extended further than 140°. Left hand contracted down and markedly deformed. Laboratory - Urine - 1011. Few WBcs. Hb. 87%. WBcs 7,400. L 36%. Monos 1%, Pmns 63%. Group IV.
12-31-30 - Complains of severe frontal headaches, especially in the morning. Aspirin gr. X. Phenacetin gr. V given with slight relief. Complains of headache in the afternoon. P. 88. T. normal.
1-2-31 - The patient is constipated and mineral oil is ordered 4 times daily. P. & T. normal.
1-4-31 - Complains of sensation as of getting a cold. Quinine, pyramidon, phenacetin gr. V each given.
1-5-31 - Nasal oil with ephedrine every 3 hours, and elixir terpine hydrate with

codeine 1 drm. every 3 hours. given.
1-8-31 - Urine 1015. Microscopic negative. T. 100. P. 72.
1-10-31 - Operation begun at 8:52 A.M. under ethylene and ended 10:10 A.M. (1 hr. 18 min.) 8:49 Anesthesia begun. P. 122. Incisions were made in the lateral aspects of both thighs at the lowerborders of the ilio tibial band and appropriate muscle tendons were divided to obtain straightening of leg. Casts were applied to both extremities. At this point the patient stopped breathing. Anesthesia second stage oxygen given and artificial respiration instituted, but of no avail. Heart was regular and pulse good. Intracardiac adrenalin tried when heart stopped. It failed to reestablish beat. Died 10:10 A.M. Pulse during operation was as follows: 8:55 A.M. 66 - 9:05 A.M. 120 - 9:20 A.M. 100 - 9:30 A.M. 132 - 9:45 A.M. 120 - 10 A.M. 138.

The scalp, calvarium, dura and dural sinuses are normal. There is marked congestion over the surface of the brain and a few hemorrhages on the right side. A large, firm, lobulated, encapsulated, cystic tumor is found between the lateral ventricles and projecting into them, resulting in enlargement of the same. This tumor had probably been there for some time from its external appearance and on section shows a firm, fibrous structure. There is slight cone formation of the medulla and surrounding structures, and the posterior edge of the sella turcica is slightly eroded but smooth. Note - The finding of brain tumor undoubtedly explains the cause of the sudden death.

DIAGNOSIS:

1. Chronic arthritis (with deformity).
2. Old sympathectomy wound.
3. Recent operation for relief of deformity of knees.
4. Brain tumor.
5. Pulmonary atelectasis.
6. Old healed tuberculosis of rt. lung.
7. Absence of genitalia & appendix.
8. Peritoneal adhesions.
9. Slight chronic cholecystitis.
10. congestion.
11. Superficial abrasions.

IV. ABSTRACT

Thesis: MALIGNANT METASTATIC BRAIN TUMOR, Dunlap, H.F. Submitted to the faculty of the Graduate School of the University of Minnesota in partial fulfillment of the requirements for the degree of Master of Science in Medicine, April, 1929.

Material: Malignant metastases to the brain has been diagnosed in 95 cases examined at the Mayo Clinic in the past 10 years (1929). The series is divided into three groups: Group 1. 23 cases, complete necropsy including examination of the brain. Group 2. 44 cases - clinical picture of tumor of brain but no gross or microscopic examination of brain tissue. Malignant primary tumor outside the nervous system confirmed by necropsy. Group 3. 28 cases - clinical picture of tumor of brain and primary malignant tumor without gross or microscopic examination. Cases of metastases to the skull without intracranial involvement or intracranial involvement by direct extension from tumor in the region, (orbit, eye, etc.) were not included.

Frequency:

1. Origin - breast 30, kidney 12, lung 9, skin 5, adrenal 5, colon 4, thyroid 4, stomach 3, testicle 3, bone 3, esophagus 1, pancreas 1, gallbladder 1, prostate 1, uterus 1, tonsil 1, parotid 1, carotid body 1, eye 1, undetermined 9. The lung, breast and kidney represent 56.5% of the series. Krasting ('06) : 50% of metastatic tumors of brain from breast and lung (43 cases from breast and 29 from lung) in a series of 130 cases of cerebral metastases. If kidney was included series showed 56%. Grantthe same three organs (51%). Author collected 108 cases from literature (54%).

Comment: Breast, kidney and lung are commonest sites of metastatic tumor to brain: Breast and lung are more frequent than kidney. Adler, ('12) : when lung was site of primary lesion 'autopsied cases) found 12%. Dosquet 31.4% and

Fried ('27) 50%. When breast was primary lesion 'autopsied cases) - Ewing, ('22) 4%, Williams 6.6%, Krasting ('06) 18.8%, Gross ('88) 15.3% (brain tissue 9.4%, dura 5.9%) Fried believes primary carcinoma of lung metastases to brain may be early and obscure symptoms of primary disease. Metastatic tumors may be diffusely distributed throughout brain and produce a glial reaction. Bizarre pictures may result which are confused with changes like snile dementia. (Note: one of our former patients came in because of senile dementia and at autopsy a silent, primary carcinoma of the lung was demonstrated. No brain examination was permitted, but this may represent this type of case.)

Autopsies on Malignancy: 6.0% of all malignant tumors metastasized to brain (Gallavardin and Varay ('03). 1078 cases of carcinoma, brain examined in 817. Metastatic deposits found in 4.7%. 160 cases of sarcoma brain examined, 118 times, metastases found, 11.6%. Series Basel (1870 to 1905) Krasting ('06).

Among Brain Tumors: Krasting: 1-3 at Basel over 35 year period. Figure probably too high. (An unusual selection?) 61 cases of metastatic brain tumor and 1308 cases of primary brain tumor at Mayo Clinic from 1919 to 1925 inclusive, 5%, and Grant Peter Bent Brigham Hospital found 4%.

Experimental Evidence: Brain seems to be resistant to metastases except from certain tumors. Ebling secured only 7.3% Grafts, on inoculating a subcutaneous carcinoma of one animal into another animal's brain, whereas he says he secured 82% successful grafts on inoculating brain tumors from one animal into the brain of another.

Mechanism of Metastases: 1. Blood born emboli; 2. Through propagation of cells along perineural lymphatics when the subdural and subarachnoid spaces are involved. Blood born metastases usually to brain substance.

Clinical Signs and Symptoms: Depends on 1. Extent of involvement by principal large mass. 2. Presence of mass, however small, in vital portion. 3. Presence of nodule so situated that it will obstruct the normal flow of spinal fluid. Certain definite signs in brain tumor which indicate metastatic origin. 1. Acute onset of cerebral symptoms, followed by development of neurological signs of disseminated character. 2. Symptoms of intracranial tension in absence of changes of discs. 3. Positive neurological manifestations. 4. Rapid evolution of neurological signs and appearance of wasting asthenia, greater than that usually seen in primary lesions. Neurological symptoms in 95 patients (author) headache 62, vomiting 39, vertigo 39, hemiplegia 39, ataxia 28, diplopia 27, visual disturbance 26, cranial nerve palsy 21, disseminated or bilateral signs 19, Jacksonian seizure 17, general convulsions 17, dysarthria 16, aphasia 11, hemianopsia 10, uncinate syndrome 5, conjugate deviation of head and eyes 3, apraxia 3, perseveration 3.

Mental Changes: 44 patients: mental changes were noted. Stupor 61%, defective memory 57%, uncooperative 54%, lethargy 48%, inattentative 45%, confused 43%, periods of irrationality 18%, depression 16%, disorientation 14%, hallucinations 10%, emotional disturbance 7%, irritability 5%.

Clinical Localization of the Tumor of Brain - 77 patients who underwent neurological examinations. Right cerebrum 19, left cerebrum 15, chiasmal 1, cranial nerves 6, brain stem 6, cerebellum 6, basal 2, Gasserian ganglion 1, 3rd ventricle 2, meninges 1. Other diagnosis 4, not stated 19.

Other factors: Average age 47.5 years (12 under 35 including 3 adrenal tumors), Sex, 50 males, 46 females. Average duration of primary, group 1, 21 months, groups 2 and 3 35.5 months. Longest duration group 1. hypernephroma

6.5 years, group 2. carotid body tumor 9.0 years, group 3. carcinoma of breast 12 years. Presenting complaint was neurological in 67 cases, general in 14 and combined in 12. The usual site of the silent primary tumor was kidney or lung. Blood Wassermann 80 cases, one positive. X-rays of chest; 78 cases revealed 47.5% with disease. (Malignancy or metastases in 37%). X-rays of head 63 cases - positive in 13 (21%). Choked disc in 40% of 84 cases examined. Optic atrophy or pallor - 3, visual field defects 9.

Conclusions: 1. Metastatic brain tumors present essentially the same symptom complex as primary brain tumors. 2. Incidence of metastatic brain tumors is at least 5%. 3. All cases presenting clinical evidence of brain tumor should be carefully studied for evidence of primary malignant tumor outside of central nervous system. 4. In more than half the cases, the tumor may be found in the lungs, breast or kidneys. 5. The primary lesion is frequently silent. 6. All cases presenting clinical evidence of brain tumor should have routine roentgenograms of chest and skull for evidence of metastases. 7. Mental symptoms, especially stuporous or confusional type occurred in over 50% of cases. 8. There are focal (tumor masses) and diffuse (encephalitic lesions) present in the brain. 9. The intensity and incidence of mental symptoms in this series appeared to have some relation to incidence and intensity of the encephalitic process.

V. CASE REPORT - SILENT NEPHROMA, METASTATIC LUNG AND BRAIN TUMORS:

The case is that of a white male farmer, 51 years of age, admitted to the University Hospital 12-3-30 and died 12-31-30 (28 days).
1921 - Began to tire easily.
1925 - Developed left inguinal hernia. Definitely weak. Began to lose weight, drowsiness troublesome, especially at noon time. Vomited 3-4 times a year. Not projectile. Began noticing eye-strain and weakness of eyes.
1927 - Urgency of urination first noticed.
1930 (January) - Began having attacks of stiffness and soreness in back of neck and upper shoulders, associated with generalized headaches. Attacks intermittent with exacerbation for 2 weeks. Returned about every 3 weeks during spring and summer. Weakness increased steadily, especially in arms. Dizzy at times. Began falling asleep occasionally at the dinner table, even while lifting food to his mouth. Always easily aroused. Rings seen floating before eyes. "Things turned black" occasionally. Non-productive cough began.
1930 (October) - Developed severe throbbing, aching sensation in the occipital region. Would subside at night and return in the daytime. Stayed in bed a week or so. Improved until Nov. 7, 1930.
1930 (Nog.7) - Weakness, dizziness, occipital headaches, nausea, retching and vomiting (not projectile). Caused patient to go back to bed. Vomiting worse if he ate very much. Improved generally during week preceding admission (12-3-30). Several physicians were seen during the year, but the powders, tonics and diets prescribed have had little, if any, effect. A blood test was negative. Poor appetite and weight loss of 40# in the last few years. Some dyspnea on exertion for a year. No hematuria, polyuria, freqneyc, burning, chills or sweats. Statement is made that he had slight attacks like Petit mal. Takes long time to answer questions.
Past History: Kicked on right side of face by horse in 1909. Inflammatory rheumatism lasting 7 days in 1910.
Family History: Brother died of apoplexy at 30 years of age, otherwise essentially negative.
Physical examination: Poorly nourished, unshaven, weak white male, appearing older than 51 years, who responds to questions slowly, moves slowly, prefers to remain recumbent. Rounded scar in right post-auricular region. Injection of conjunctival vessels of right eye. Pupils equal, (4-5 mm.) regular and react to

light and accommodation. Neck - tenderness in post occipital region and down neck. Neck slightly stiff and a little extended, moves head carefully and slowly. Lungs fremitus more marked on the right. Heart rate 100, many extra-systoles. Abdomen firm, movable, tender mass with a straight border below left costal margin, moving very little with respiration. Slight bilateral, inguinal adenopathy. Abdominal and cremasteric reflexes absent. Babinski negative.
12-3-30 - Laboratory - Hb. 72, RBcs 3,660,000, WBcs 6,950. Pmns 69, L 27, M 3, B 1. Group IV. Stools - Benzidine - positive, no gross blood, pus or mucus. Urine - an occasional WBc. State Board of Health and Larson Wassermann negative (Spinal fluid). Blood Wassermann - State Board of Health - negative. Larson? Colloidal gold - negative. Noguchi - strongly positive. Appearance - clear, fairly yellow. Pressure - 250 mm. water. On compression of jugular - 345 mm. 10 WBcs, numerous RBcs. Blood chemistry- B.U.N. 27.53. Sugar .136. Patient is very weak.
12-4-30 - Nauseated and dizzy. Ophthalmology consultation - Slight drooping of left lid. Left pupil smaller than right. Fundi show choked discs with hemorrhages and exudate, the findings in the right being more marked. The right shows a little over 2 diopters, and the left slightly under 2 diopters elevation. While there are signs of moderate hypertension, it does not seem that this would be the basis of the choking. Findings suspicious of increased intracranial pressure, possibly due to intracranial tumor or meningitis.
12-5-30 - Staff note - (additional history) - Wasting of musculature for 3+ months. Neurological signs essentially negative except for weakness of extensors and flexors of arms. Slight bilateral ankle clonus. Slight atrophy of intrinsic muscles of hand. Eye symptoms and findings indicate some intra-cranial lesion. Spleen - enlarged and palpable. Heart - Slight systolic murmur; occasional extra-systole. Rectal - negative. Lungs - clear. A prac-tically healed ulcer present in the right mastoid area. No lymph node involve-ment of that area. Impression: (1) Possible brain abscess; (2) possible brain tumor; (3) possible post-encephalitis; (4) Splenomegaly; (5) Secondary anemia.
Electrocardiogram - Shows left ventricular preponderance.
Dermatology consultation: Basal epithelioma over the right mastoid. Biopsy taken. Diagnosis confirmed 12-17-30.
12-6-30 - X-ray - Mastoids negative. Calcification of pineal gland and dis-placement to left of midline. Suggestion of erosion of superior clinoid process. Diagnosis - Possible tumor of brain. Neurological consultation - Eyes as above plus dilatation of the pupils and nystagmus on looking to right. 36" watch only in contact in left ear. 4"-6" in the right. All muscles atrophicnad of poor tone. Co-ordination - More certain of self with left hand. Findings indicate left (frontal) pre-central gyrus lesion. Encephalogram indicated if chest plate is o.k. E. E. N. & T. consultation (rule out Menier's disease). Nothing to indicate this.
12-7-30 - Nauseated. S. S. enema with good results.
12-8-30 - Stool negative. Transfer diagnosis - (1) Splenomegaly (2) Dental sepsis (3) anemia (4) Possible intracranial lesion. Transfer to N.M. X-ray - Round filling defects in the stomach suggestive of retroperitoneal tumor. Slight retention at end of 4 hours. Chest - Round, dense shadows characteristic of metastases. Patient weak. Emesis once.
12-9-30 - Urine - Occasional Wbc. Emesis of undigested food and brownish fluid.
12-10-30 - Urine - Negative. Emesis dark green fluid; weak and tired. Not well oriented as to time. Condition poor.
12-11-30 - Consultation - Prostate enlarged, grado I. No suggestion of malignancy. X-ray - No metastases in pelvis. Emesis in A.M. only. Ice cap for headaches with relief.
12-12-30 - Emesis 50 cc. Slept fairly well. Spinal fluid - Larson and State Board neg.
12-15-30 - Spinal fluid - yellow, clear. Pressure 210 mm. water. Went up on pressure over jugular. No WBcs, many RBcs. Nonne positive. Noguchi negative. State Board - neg. Colloidal gold - 0012330000. 100 cc. of 25% glucose given

intravenously. Pain in back of neck. Potassium iodide M x t.i.d. begun.
12-19-30 - Consultation - No evidence of hypernephroma. Suggest uroselectan visualization. During these days the patient continued to vomit 2-3 times a day. Complained of pain in the back of neck. He was given aspirin and phenacetin for headache on last day. Intravenous glucose 25% was given on the 16th, 27th, 29th. Proctoclysis was begun.
12-28-30 - Temperature remained about normal during this whole period. It rose to 101.2 on the last day. The patient died 12-31-30.

The scalp and calvarium, dura and dural sinuses are normal except for adhesions in the right temporal region. The brain is removed. It is noticed that the surface is very dry and flattened. On section of the right cerebellum a hemorrhagic tumor mass is found without any definite capsule measuring 2 x 4 cm. In addition on the right temporal lobe there is a mass 5 x 7 cm composed of hemorrhagic, very firm tumor tissue. This was adherent to the dura in this region. Two cones are present; one in the region of the optic chiasm, the other in the cerebellum. Both are due to pressure. The 3rd ventricle is enlarged; the obstruction probably due to distortion of the brain. Pineal body is calcified and dislocated partly to the left. Both lateral ventricles are enlarged.

DIAGNOSIS:

1. Hypernephroma of left kidney.
2. Metastases to lungs and brain.
3. Emaciation.
4. Cones of cerebellar and supercerebellar region.
5. Erosion of sella turcica, chiefly on the right.
6. Pigmented, melanotic patch on right temporal region.
7. Crusted lesion of right neck.