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HISTORY OF RADIOLOGY

UNIVERSITY OF CALIFORNIA IN SAN FRANCISCO

AS SEEN BY

EARL R. MILLER MD

in mid 1980's

This document is a copy of the text used by Dr, Miller in recording a video- taped oral history of the Department as he lived it.

OPENING REMARKS

On page 3 of Beryl Markham's book

WEST WITH THE NIGHT

I found a quote that best describes this morning's activity:

THIS IS A REMEMBRANCE, A REVISTITATION;

AND NAMES ARE KEYS THAT OPEN CORRIDORS

NO LONGER FRESH IN THE MIND,

BUT NEVERTHELESS [redacted] FAMILIAR IN THE HEART.

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EARL HISTORY

Even in the early 1940's, a nukber of departments such as Urology, ENT, many of those in Neurosurgery etc made their living in down town offices and either donated their time or received little pay. They worked there part time. sGradually the UC became peopled by full time employees with additional Clinical faculty on a part time unpaid basis. There were no full time paid faculty at the SFG.

Howard Rugles Was the first Radiologiist at UC. He had his ofdice downtown and came in daily to read films that were ordered by the ~~clinical-fac~~ clinicians.and taken by the technicians. He would read even a single film of an extremity for example. He wrote with Holmes of the MGH in Boston, the first major textbook of radiology. It was THE textbook.. 5/8 inch thick and covered all of diagnosis and therpy.

He loved his greenhouse.. During his time at UC, Glass plates were used. He took the obsolete ones and built his greenhouse with them. Look down see a flower... look up and see duodenal ulcer, Pagets disease, sarcoma of bone.

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Stone first full time radiologist, from Canada, Became a full professor in 1938 . The dept was a branch of surgery until aboiut 1940-41. Stone was the first chairman and no on else had a title except an academic one. In thise days only the chairman became a professor.

1942 Arthur Compton invited Stone to Chicago to set up the Radiation health Division of the Metalurgical Laboratory. Later, he went to Oak Ridge where he spent most of the war years. He returned to UC and reassumed the Chairmanship. in 1946 . He retired in 1964 and died in 1966 of Cancer.

Stone's activitites: Before I came in 1940, Stone did both diagnosis and therapy as did almost all radiologists. He was the firdt to administer 1000 KV therapy and the first to use radioactive isotopes with therapeutic intent. He was proud of his work in diagnosis as can be seen from the the encephoalogram in his portrait. but his real forte was in therapy. After the War, he understook neutron therapy in Berkeley using the 60" cyclotron. This was amother milestone. The AEC fubded the Radiological Laboratory where he directed research with the synchrocyclotron and did patient therapymwith this modality.

With the coming of the HCMoffitt Hoppital, he got the funds to finace the 13th floor as a Cancer Research Institute. T This was$1,000,000... a hugh amount in those days.(When the committees were formed to get the new hopsital, the estimate for the whole plan was $2,000,000.

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Dr Robert Stone

Refer to Obituary for details of dates.

Outside activities

He had a lovely home in Firest Hills in SF. His garden was a showcase. He did all of his gardening. He spent his vacations in the high Sierras hiking and fishing and photographing. He enjoyed his weekly bridge seession.

THE DEPARTMENT IN 1940 East end of third floor UC Hosp.

THERAPY 200 KV 1000 KV 1 low voltage maching along one corridor

DIAGNOSIS: 2 radiographic rooms, 1 fluoro, 1 darkroom in 1 corridor

1 reading room with 4 reading areas on the "poop-deck"
1 small consultation room
4 typist ~~room~~, small file room, and Dr Stone office and place for his secretary. Dr Capp and I were the staff. 2 residents. We all lived and worked on the Poop deck.

The #1 Chest room had a modern 3 phase generator.

#2 room had a mechanical rectifier and open bowl tube holder with exposed high voltage wires.

Fluoro had discarded therapy tubes for rectifiers and no facilities for spot filming. Dr. Jim Irwin and I blew out so many of the rectifiers/doing hand-held spots in fluoro that we finally got some decent equippment for spot filming in 1940.

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GROWTH OF THE DEPARTMENT

1941 I got an office in the old radon plant room(Shades of old times. I made my living during medical school years running a radon plant in The Dept of Radiology in University of Wisconsin.) Research with I^{131} done here.

1950 Dr. Mike Shimkin brought a Cancer Research Lab to the Laguna/Honda Hospital. In it was an obsolete fluroscopic-radiographic room. Here, with Dr, Howard Bierman, we did aterial catheterization and visualization of all of the visceral arteries of the body by introduction of catheters in the brachial, corotid, and femeral artieries. Chemotherapy was carried out via cathether in the hepatic artery to metastases in the liver.

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1953 Radiographic equippment was installed in the Thoracic Clinic in the old Clinic building. Here the first x-ray movies were carried out first using 16 mm format and later the 35 mm format. These were done with a ~~special~~ lens manufactured specially by Eastman Kodak. 9 were made. Aperature 0.65. They weighed about 10 pounds. Special glass have to be manufactured to be able to achieve this high aperature. Pediatric patients were studied here because of their small size. The early studies of cardiac anamolies were done here.

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1958 President Robert Gordon Sproul was instrumental in getting me space for the Radiological Research Laboratory. It was first housed in the basement of the medical school building. 3200 square feet. When The Moffitt Hospital and the East and West Health Sciences Towers were built, this lab was relocated in the basement of the East Tower. The Lab consisted of a large well equipped shop, Electronics lab, x-ray room, dark room conference room, and office,

1960 H C Moffitt Hospital opened. Radiology occupied the 3rd floor. Therapy occupied the East end with north-south and east west corridors.
Diagnosis occupied the big square block on the south side. The east corridor was used for in-patients and the west corridor for out-patients. Each had 4 radiographic rooms. The south side of the dept had 3 fluoro rooms. All the films moved to the central double dark room area. They were wet processed by automatic machines now totatly obsolete. The films were taken north to the file room, north again to the reading rooms and then north to the consultation room. Originally 4 separate reading room were provided. These provided privacy but also provided isolation. They wwre replace by a large single reading room. Offices occupied the north side of the main Hospital corridor.

Cancer research Institute occupied the 13th floor of Moffitt. This was brought to the UC by Dr. Stone with Funds from the Cancer Institute of the NIH. In it was an experimental x-ray room. Dr. David Wood was the first director. This was a large fluoro -radiographic set up. It waas a patient service room used only for experimental studies.

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This room was originall designed to be used by Dr. Howard Bierman and me for continued work on cancer chemotherpy using intra arterial administration of drugs. Dr. Bierman left the University about this time and the room fell to me for my use. Here I had the first image intensifier-image orthocon TV equippment. The rest of the equippment for this room was designed and built in the Radiological Reseach Lab. It was in this area that the physiology of the lower urinary tract was worked out using a highly sophisticated mammogram equippment. We also studied the action of the mouth and pharynx during speech and swallowing in patients with speech abnormalities, mainly cleft palates. (If time permits I will show a movie illustrating the results of these studies)

1962 Dr. Margulis became chairman of the department.

He developed the department as you see it now. This was the best thing that ever happened to the Department of Radiology at U C. Dr. Margulis brought a whole new attitude about what a department of Radiology should be and he succeeded in changing it into his mold. He made it the best in the world. He recruited a young and vigorous and imaginative staff. He was offered every available chairmanship in the country and UC was lucky to have him. From a personal point of view, he made my life a joy for many years.

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General comments about the changes that occurred during my career in the field of Radiology.

UC went from a proprietary madical school dedicated to caring for patients and teaching the care of patients to one in which research became one of its overriding drives.

Many residencies in Radiology were established in private hospitals and in private practices of Radiology. A number were used as slave pens for the trainees. I was part of a committee of the AMA whose job it was to evaluate residency programs and to grant or withold approval for them. This was a most powerful committee in changing the face of residency training into its present form.

Board Exams American Board exams were given in the whole field of Radiology.. therapy and diagnosis. Examinees were expected to know the whole field as it then existed. It was possible to do this since there were only two main Journals to read in the field.: Radiology and the American Journal of Roentgenology. In my third year of training I reread the entire radiological literature for ten years in preparation for the exam. This took every night for four months.

Specialization The first beginnings of specialization were in the separation of diagnosis and therapy. A large number of departments were run by men who were primarily therapists. Radium and x-ray therapy were the modalitties that separated radiologist from the rest of the medical profession. A large number of internists, orthopedists, pediatricians, urologists etc had diagnostic machines in their offices and practicied diagnostic Radiology. Diagnostic Radiologists practiced all

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aspects of the field. Many still do in private practice. In the Universities specialization into many kinds of subspecialties in the field of Radiology became the norm as you know it today.

Automatic rapid film processing- completely revolutionized the practice of Radiology when it was first introduced. It had a greater effect on the practice than did any other single peice of equippment in my experience.

Cat Scanning and NMR have been developed and introduced into the practice of Radiology since my retirement in 1974. These had as much influence in the practice as did the new film processing.

Radioisotopes The only radioisotopes used in medicine when I started in radiology were radium and radon for the treatment of Cancer. Artificially produced radioisotopes became avilable with the advent of the Manhattan Dictrict and thus created a whole new subspecialty in Radiology.

Ultra sound was unheard of in 1940. Now it too has become a subspecialty in its own right.

Image intensification made the use of television possible in Radiology and it in turn allowed x-ray movies to be done with acceptable patient exposure. This in turn opened the way to the introduction of highly sophisticated Physiological studies.

Angiography in all of its ramifications and the use of catheters for minute anatomical studies and interventional Radiology for therapy were unheard of in 1940 and now are a most important part of Radiology

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A reveiew of my own career in Radiology and some of the lessons I learned from it.

My Undergraduate and early postgraduate training was in physics and math. Because of this I was able to work in a Dept of Radiology as physicist and earned my way thru medical school running a radon plant.

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Review of my own career in Radiology

Number 1: I am the luckiest man in the world. I often worndered why I shouldn't pay the University for the privelege of working in it and particularly in the field of Radiology where every case is a challenge and every day was fun.

I learned that History is for the old. The OLD have only the past to think about whereas the young have the present and the future to think about

One should prepare for retirement at age 13 so that you will be ready for it when it comes.

Retirement is a time for review of one's career and that will be of interest only to the one who does the reveiw since it does not matter to anyone else. Nevertheless, here goes:

The only part that counts is the legacy of papers that one writes. Lectures disappear into thin air. Committee work gives a chance to know about one's collegues but in general is a waste of time. Choose only the committees that further your own goals: in my case education and research.

I found it fun to reveiww the dates and times at which I was involved in various kinds of activities by a review of my bibliography:

17 clinical papers	1939-64
Clinical papers	
16 papers on imaging and image manipulation	1942 -74
5 papers on study of error	1944-52
9 papers on angiography	1944-53
21 papers on I^{131}	1948-59
5 on Biological effects of radiation	1948-49
10 on x-ray movies	1951-60
21 on physiology of the lower Urinary tract	1954-79
9 on study of abnormal speech	1962-72
3 on disemination of x-ray information	1973-74
18 Miscellaneous	1952-71
American College of Radiology	1950-65
National Institutes of Health Research panels	1960's one 70's

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Acknowledgements for the Lab

I am eternally grateful: To Dr. Stone who helped me to get the Lab and to have the time to work in it.

To Dr. Margulis who also gave me the time to work in the Lab.

To President Robert Gordon Sproul who found the funds to fornish the lab and decreed that space would be found.

To Mr. Alan Cline, Ed McCurry, and Bernard Hrushka who worked with me for the many years in the lab.

To the Regents who named the lab in my honor.

To Dr. Stone for giving me a job at UC.

To Dr. Ernst Fonie, at University of Wisconsin, who gave me a lab to work in and a job which allowed me to work my way thru Medical School.

To my many teachers among whom were Dr Hugh Wilson at Yale, Dr. Harry Garland at the SFG, DR ROBERT Newell at Stanford, Dr Stone and Dr. Margulis. at UC.

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