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Radiological Facilities At Iowa State College

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AFTER two years of persistent effort to overcome material and labor difficulties, the installation of the most powerful x-ray therapy unit for use exclusively in the treatment of animal diseases has been completed in Stange Memorial Clinic of Iowa State College.

This therapy unit is a Maximar 250, manufactured by the General Electric X-ray Corporation, and is the only one of this capacity in any veterinary institution in the United States or Canada. The only two schools to approach this size are the University of Pennsylvania School of Veterinary Medicine with a Maximar 220 and the Ohio State University College of Veterinary Medicine with a Maximar 200. The numerical designation of these therapy units represents the peak kilovoltage.

The therapy unit in Stange Memorial Clinic is mounted on a ceiling crane which allows maximum mobility in almost any direction. The therapy head weighs approximately 1,000 pounds, primarily due to oil insulation and cooling. The head contains among other things the step-up transformer and oil-cooled therapy tube. The head can be rotated 300 degrees and swiveled 360 degrees. Raising and lowering is controlled by a five speed electrically driven winch.

The machine can be used for superficial or deep therapy, the voltage ranging between 100,000 and 250,000 and milliamperage between 5 and 15. Emitted irradiation is passed through aluminum, copper and thoraceus filters which increases the penetration and reduces surface tissue damage.

The necessity of limiting the irradiation from this unit to rather small disease areas required the construction of a special hydraulic operating table upon which large animals could be effectively restrained to minimize movement. The therapy treatment table is of the commonly used hydraulic type but has one unusual feature; it can be tilted in either direction. This permits the treatment of ventrally located lesions with the same ease and effectiveness as those located on the back or side of the patient. This 2-way tilt feature is also considered important from the radiographic standpoint.

Another specially constructed mechanism for use in animal therapy is the adjustable port required to control the size of the area receiving the irradiation. Distance rods of 35, 50, 70 and 100 centimeters allow the operator to return to previously determined port settings for any given animal undergoing treatment, with complete assurance that the same diseased area will receive irradiation. Additional safety factors for preventing unnecessary irradiation of healthy tissue are lead foil shields, lead rubber shrouds and occasionally sheet lead shields.

A special light mobile table is used for treatment of small animals. Large dogs such as Great Danes, St. Bernards and Greyhounds are confined directly on the table top. Smaller dogs such as Boston Terriers, Cocker Spaniels and Pekingese are confined on a trough-shaped board which rests on the top of the treatment table and can be moved about by the operator. The board has sufficient table contact to prevent the animal from moving.
it out of position through struggling.

Some of the disease conditions for which the therapy machine is used and an indication of the effectiveness of x-irradiation for these conditions are listed below:

1. Superficial dermatitis accompanied by intense pruritis. (excellent)
2. Diseases of sebaceous and sudoriferous glands. (very good)
   (a) Seborrhea-dry or oily
   (b) Interdigital acne
   (c) Circumanal adenitis
3. Keratin producing dermatites. (good)
   (a) Hyperkeratotic eczema
   (b) Certain warts
   (c) Acanthosis nigricans
   (d) Keloids of cicatricial origin
4. Squamous or impetiginous otitis. (fair)
   (a) Otitis ceruminosa
   (b) Erosive hyperplastic otitis externa
   (c) Trichorrhexis nodosa
   (d) Common sycoses
5. Fungoid infections. (fair)
   (a) Botryomycosis
   (b) Streptothricosis
6. Sub-acute surgical conditions. (helpful to good)
   (a) Sores
   (b) Ulcers
   (c) Panaris
   (d) Infiltrations of an inflammatory nature
   (e) Periostitis
   (f) Lymphadenitis
   (g) Certain fistulae
   (h) Abscesses of strangles
7. Lymphatic leukemia. (favorably influenced but not permanent)
8. Chronic and acute arthritis. (alleviates pain)
9. Salivary fistulae. (almost specific)
10. Parenchymatous goiter. (helpful)
11. Hypertrophy of prostate gland in dogs. (excellent)
12. Chronic cystitis. (good)
13. Adenomas and adenoeplitheliomas of the anus and mammary gland. (destroyed)
14. Primary carcinoma. (excellent)
15. Sarcomas

*Spring, 1949*
The therapy table, elevated, with the powerful therapy unit suspended from the I beam to the upper left.

(a) Fibrosarcoma (made worse by x-ray therapy)
(b) Osteogenic sarcoma (made worse by x-ray therapy)
(c) Neurofibrosarcoma (made worse by x-ray therapy)
(d) Round cell sarcoma (improved or destroyed)
(e) Spindle cell sarcoma (improved or destroyed)

It would appear that a combination of Roentgen therapy, surgery and postoperative therapy produces the best end results in handling sarcomas if they have not already metastasized.

Diagnosis as well as Roentgen therapy is adequately provided for in the radiological section of the clinic. Two radiographic machines are available for radiography and fluoroscopy. The smaller unit, which has been in use for some time, is a General Electric model F1 portable x-ray machine, while the larger is a General Electric model D3 mobile unit. The former is a 10Ma. fixed voltage unit useful in making radiographs of small animals and the extremities of large animals in hospital stalls and out on the farm. The larger unit is a 25Ma.-90KvP mobile unit which requires a special power line when operated at capacity, and therefore has to be used in the hospital. It is used for both large and small animal work and successfully penetrates much thicker parts than the smaller unit is capable of doing. Both machines can be used for fluoroscopy and adequate protective measures are provided for the radiologist and the students. As an example of the protection, some 8 to 10 tons of lead were used on the walls of the x-ray rooms to protect the personnel from stray irradiation from all machines.

The radiological section is located in
the west wing of Stange Memorial Clinic and occupies three rooms; a large radiographic and therapy room, a combination control and processing room, and a record room in which radiographs and therapy records are filed. The radiographic room contains the x-ray machines and treatment tables as well as the necessary equipment for restraint.

This year a formal course in radiology has been instituted. It consists of radiography, fluoroscopy and protective measures employed during operation of x-ray machines. Special emphasis is being placed on interpretation of radiographs. This course will be required of all students in their clinic years.

Dr. M. A. Emmerson, D.V.M., M.S., Dr. Med. vet. (Zürich), is radiologist in charge of the Radiological Section of Stange Memorial Clinic. He received his D.V.M. and M.S. degrees from Iowa State College in 1925 and 1928 and his Dr. Med. vet. (Zürich) in 1930. He also started radiographic and fluoroscopic work at the University of Pennsylvania in 1930. His experience in x-ray therapy dates from 1938, also at the University of Pennsylvania, where he was in charge of the Department of Radiology of the School of Veterinary Medicine. In addition he has had two years of training at Memorial Hospital in New York City under Drs. Failla, Quimby, Ewing and McLean. Special work in the physics of irradiation was
Control panel for the therapy unit the most powerful unit in use in any school of veterinary medicine in the United States or Canada.

done at Philadelphia General Hospital under Dr. Weatherwax. In May and June, 1939, he visited the Roentgen Institute, Vienna Veterinary High School, the director of which was Prof. Alois Pommer. He also visited the schools of Munich and Zurich.

(The author is indebted to Dr. M. A. Emmerson for his cooperation and many helpful suggestions.)

Verification that Iowa State College is the only Veterinary school using a 250 Kv apparatus has been received from the General Electric X-ray Corporation.

Attention Alumni

You will be receiving circulars giving more definite plans for a "First Annual Student Sponsored Iowa State Veterinary Alumni Homecoming and Reunion" to be held at Homecoming Oct. 13, 1949 for returning veterinary alumni, their families and friends. The Veterinary Student and the Student Chapter of the A.V.M.A. will make arrangements for a noon picnic luncheon and good seats reserved in a block. Room reservations are also planned. For further information see the next issue.

Diseases Indexed

The new draftees aren't the only ones whose records are being transformed into a bunch of holes punched in cards. The Army's Institute of Pathology has recorded, via big-business punch card methods, the records of nearly 4,500 animal disease cases.

The idea is, of course, to facilitate research and the study of animal disease problems. The institute has also prepared master sets of slides. These slides show specimens of healthy animal tissues to be used in comparison with diseased tissues.

According to a report issued by the AVMA committee on registry of veterinary pathology, the selection of material on pigs, goats, cats and dogs is the most advanced.