

C.L. Davis

Laboratory Animal Workshop

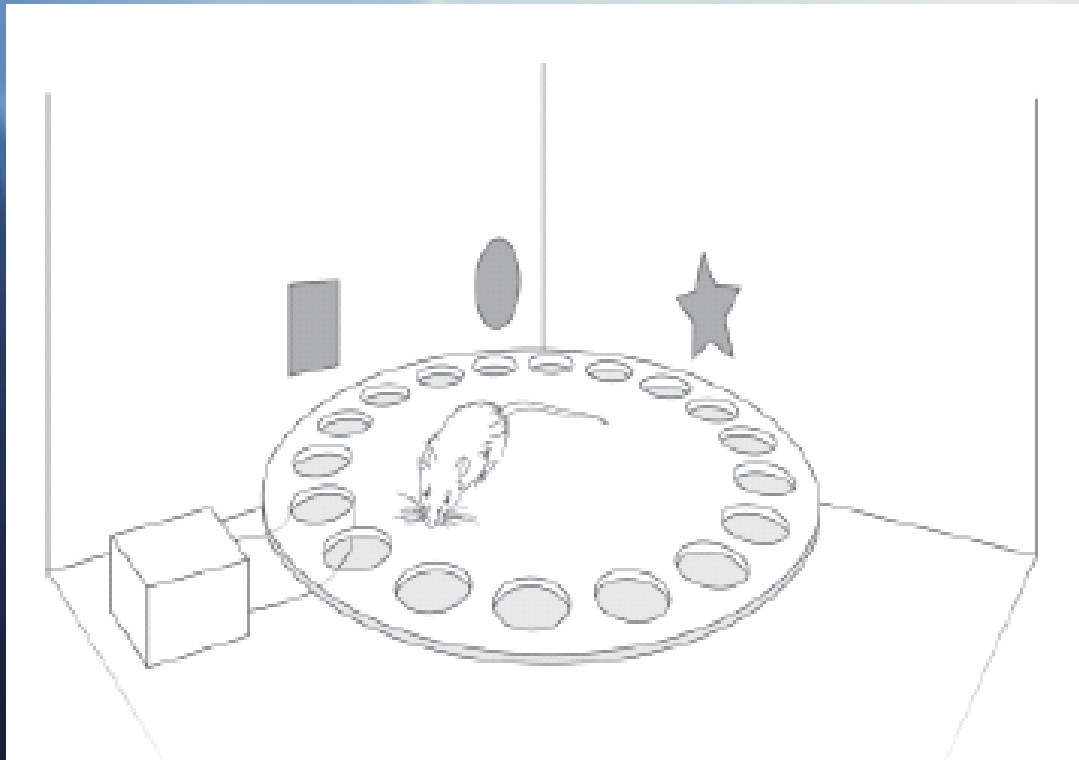
Equipment II

Supplement

Raleigh, NC
May 12, 2006



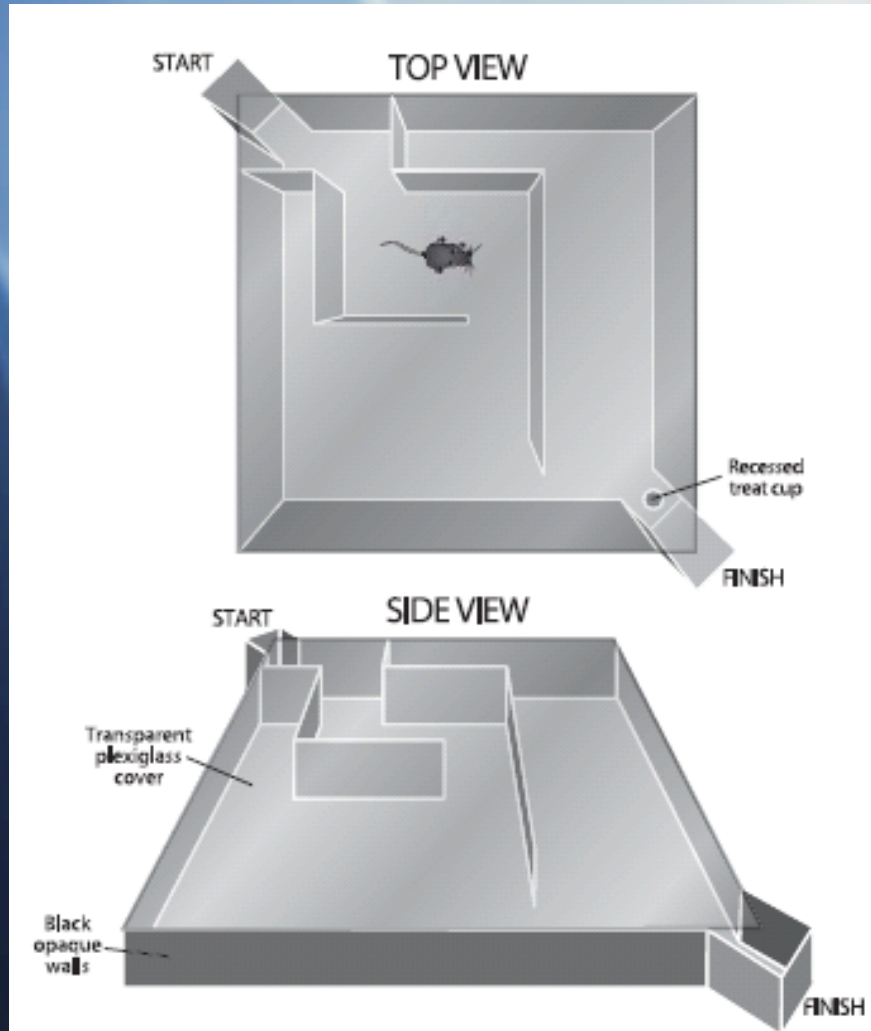
Barnes Maze



- Tests learning and memory
- CT 42(3), May 2003



Hebb-Williams Maze



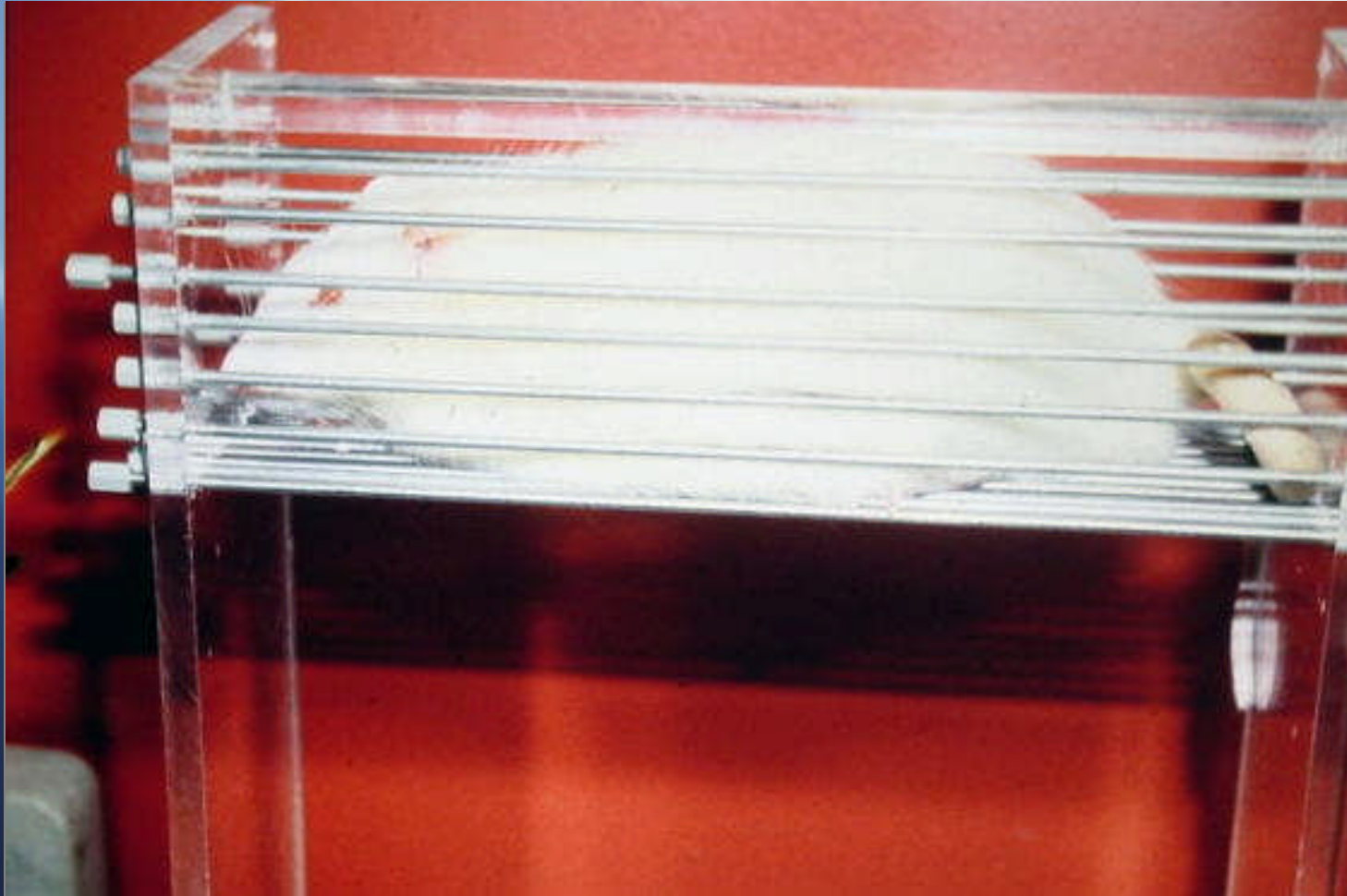
- Testing learning and memory
- CT 43(5), Sept 2004



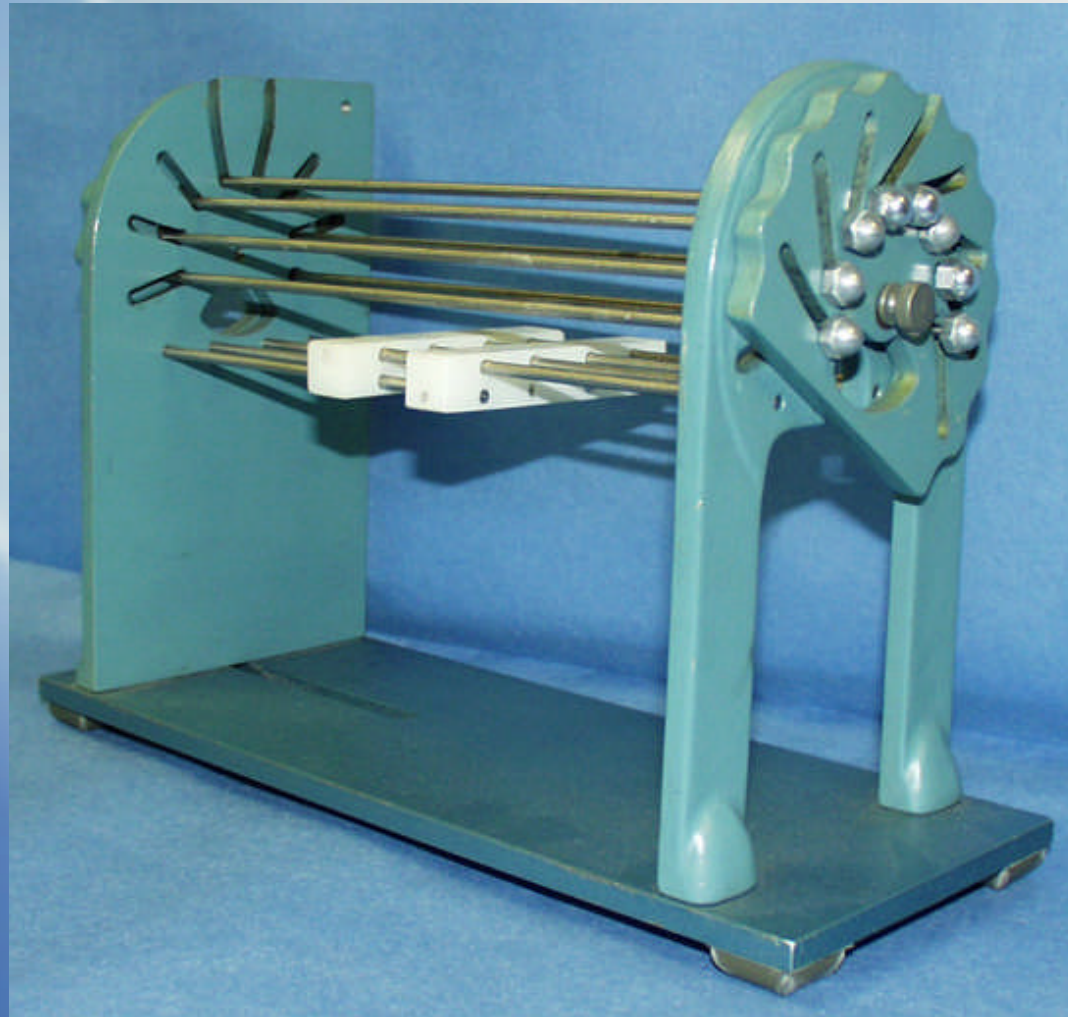
Bollman Apparatus



Bollman Apparatus with Rat



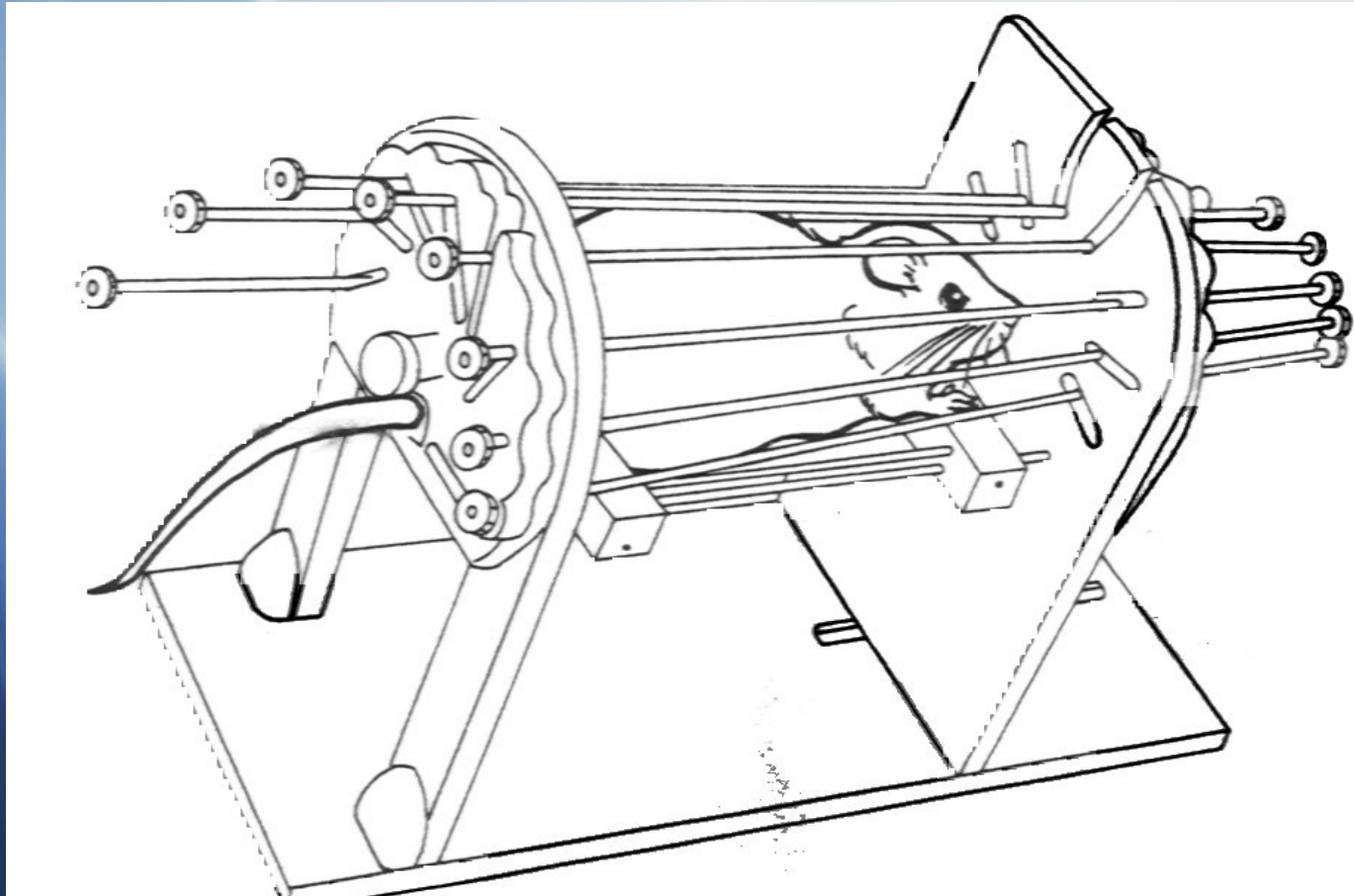
Bollman Cage



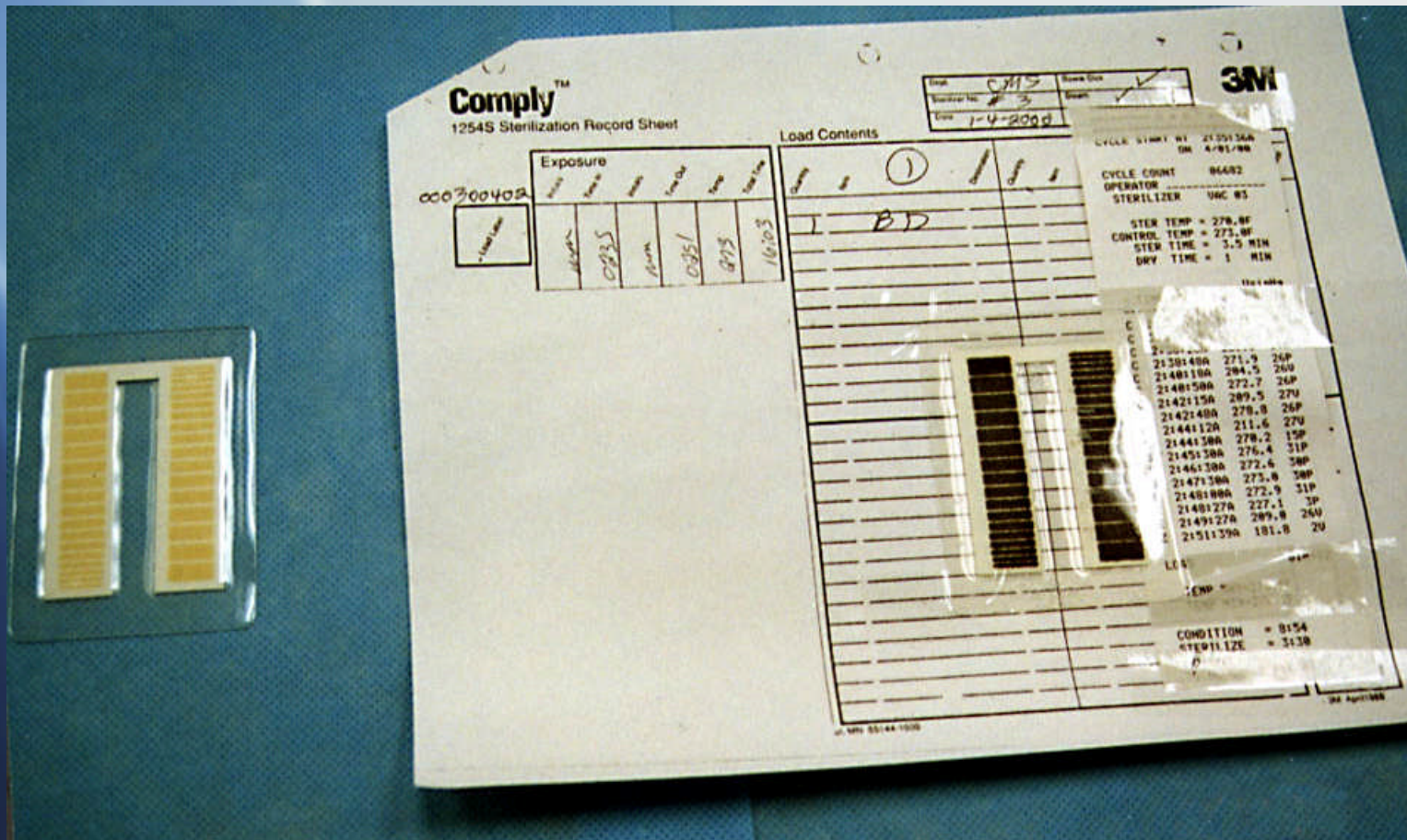
rat restrainer used in lymph or bile collection



Bollman Cage



Bowie-Dick Test Card (DART – Daily Air Removal Test)



Comply™
1254S Sterilization Record Sheet

000300402

Load Contents

Exposure	Time	Temp	Time	Temp	Time
0835					
11:00					
0851					
0903					
16:03					

Load Contents

Load	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
BD																				

3M

CYCLE START NO. 2150136A ON 4/01/00

CYCLE COUNT 06682

OPERATOR

STERILIZER VMC 03

STER TEMP = 270.0F

CONTROL TEMP = 273.0F

STER TIME = 3.5 MIN

DRY TIME = 1 MIN

Load	Temp	Time
2150140A	271.9	26P
2148110A	284.5	26P
2148150A	272.7	26P
2142115A	289.5	27U
2142140A	270.8	26P
2144112A	211.6	27U
2144130A	278.2	15P
2145130A	276.4	31P
2146130A	272.6	50P
2147130A	273.8	50P
2148100A	272.9	31P
2148127A	227.1	3P
2149127A	289.8	26U
2151139A	181.8	2U

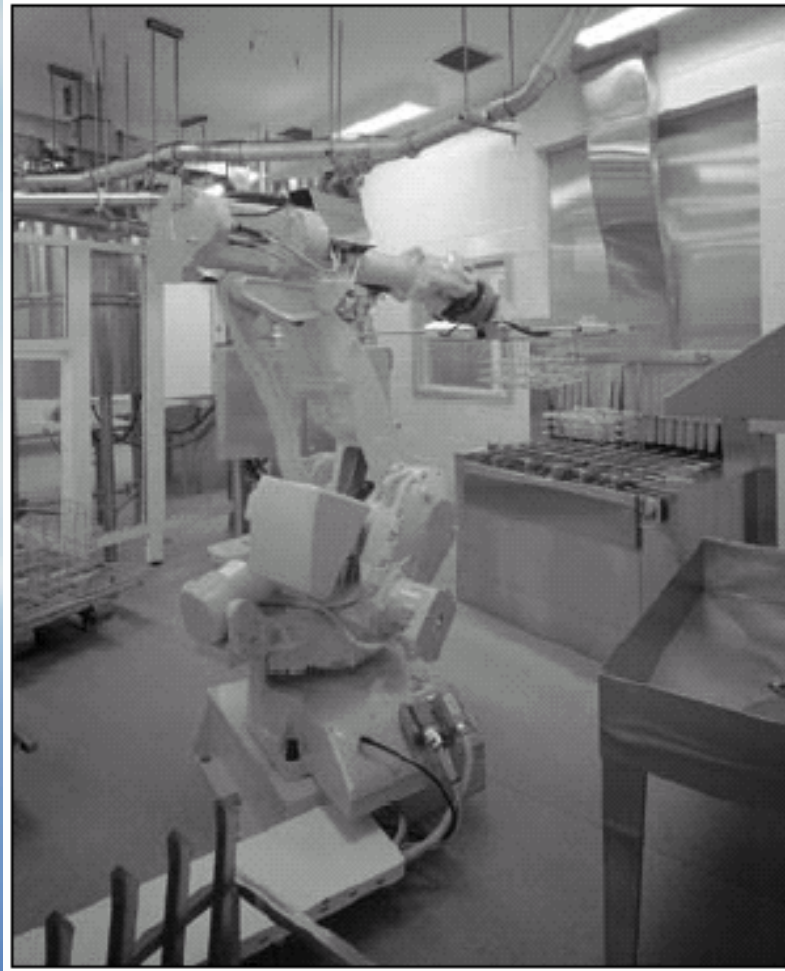
CONDITION = 0154

STERILIZE = 3130

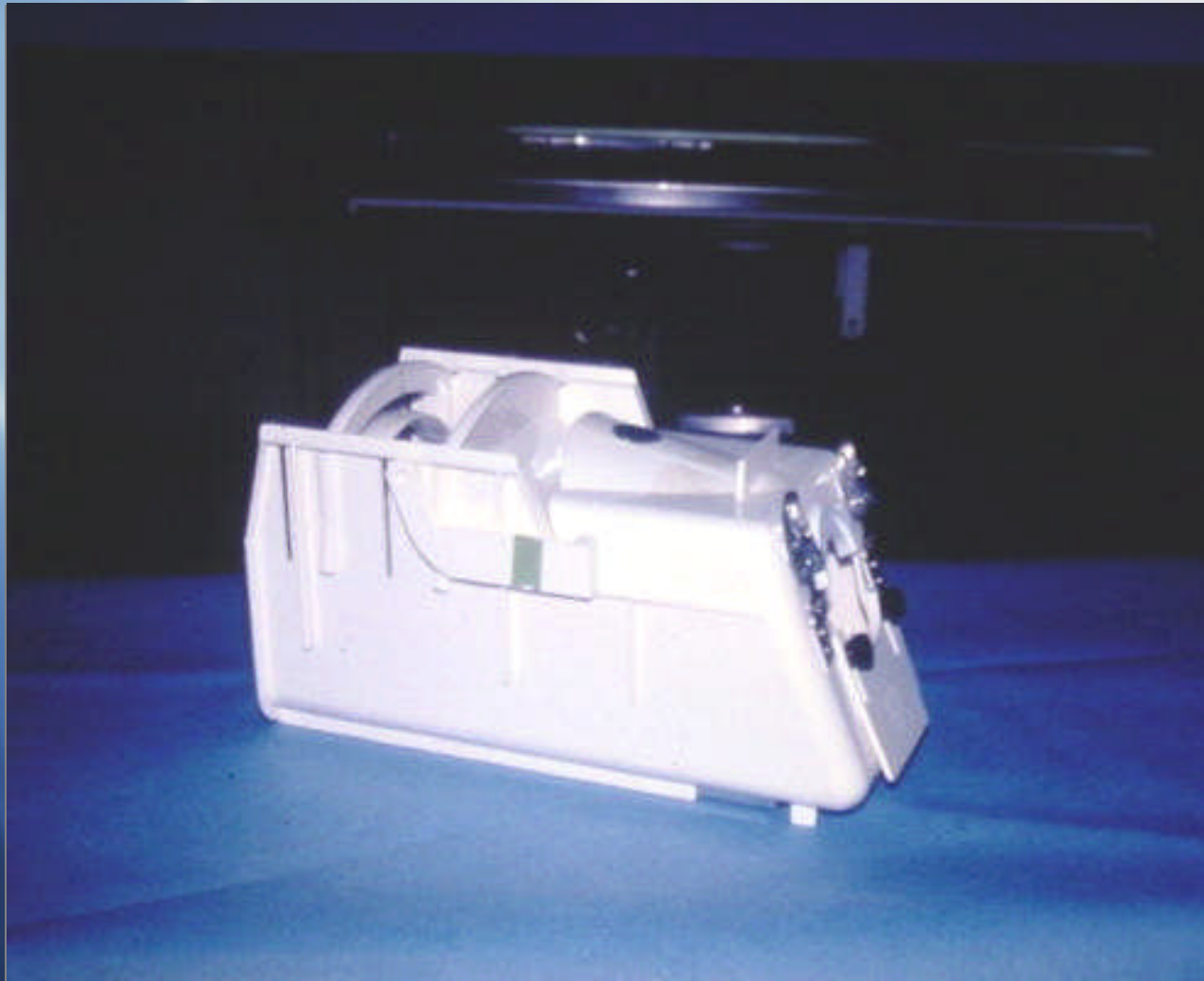
Tests vacuum of steam autoclave
(complete color change to black = sufficient vacuum).



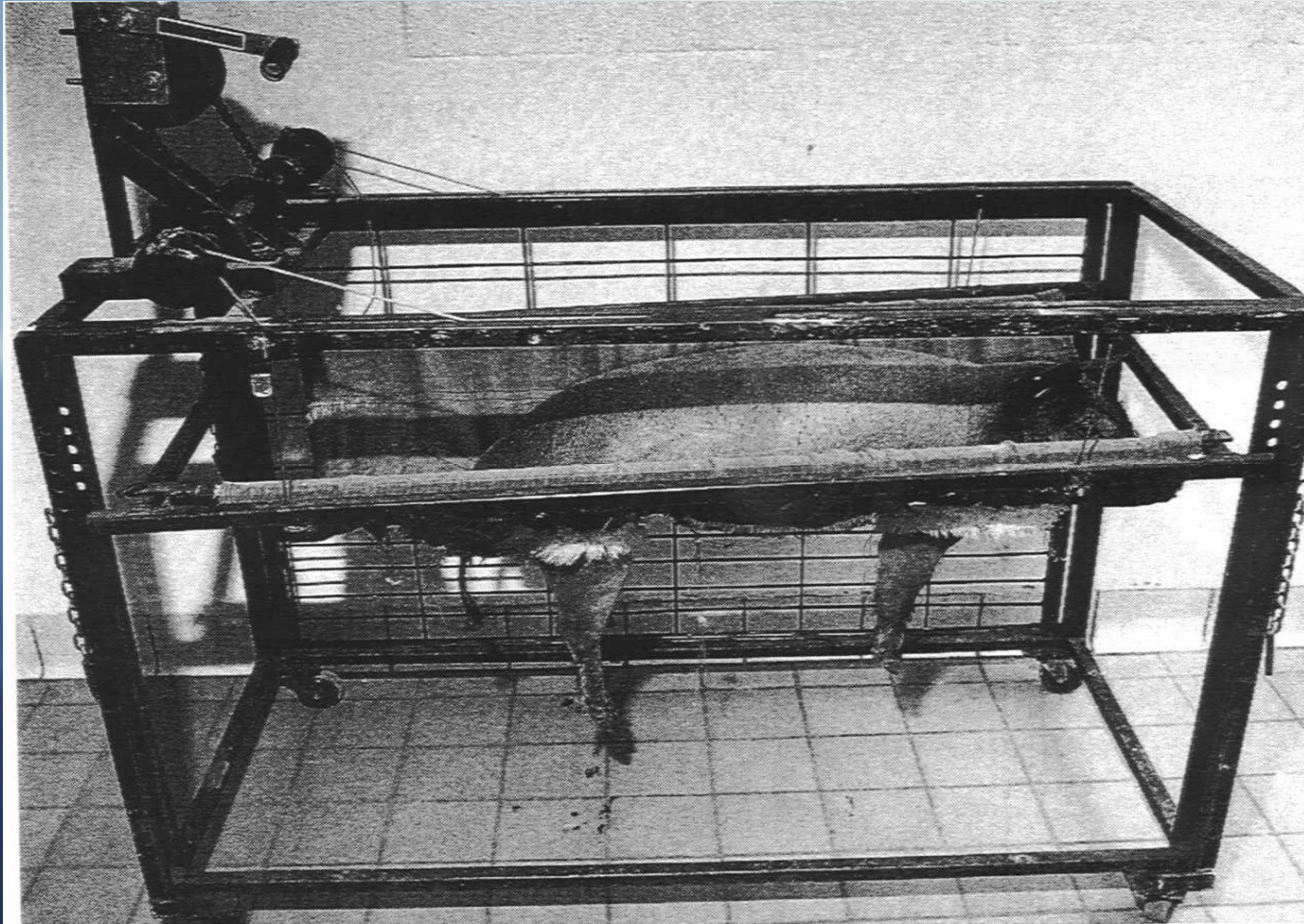
Robot (for handling cages in/out of tunnel washer)



Rabbit restrainer

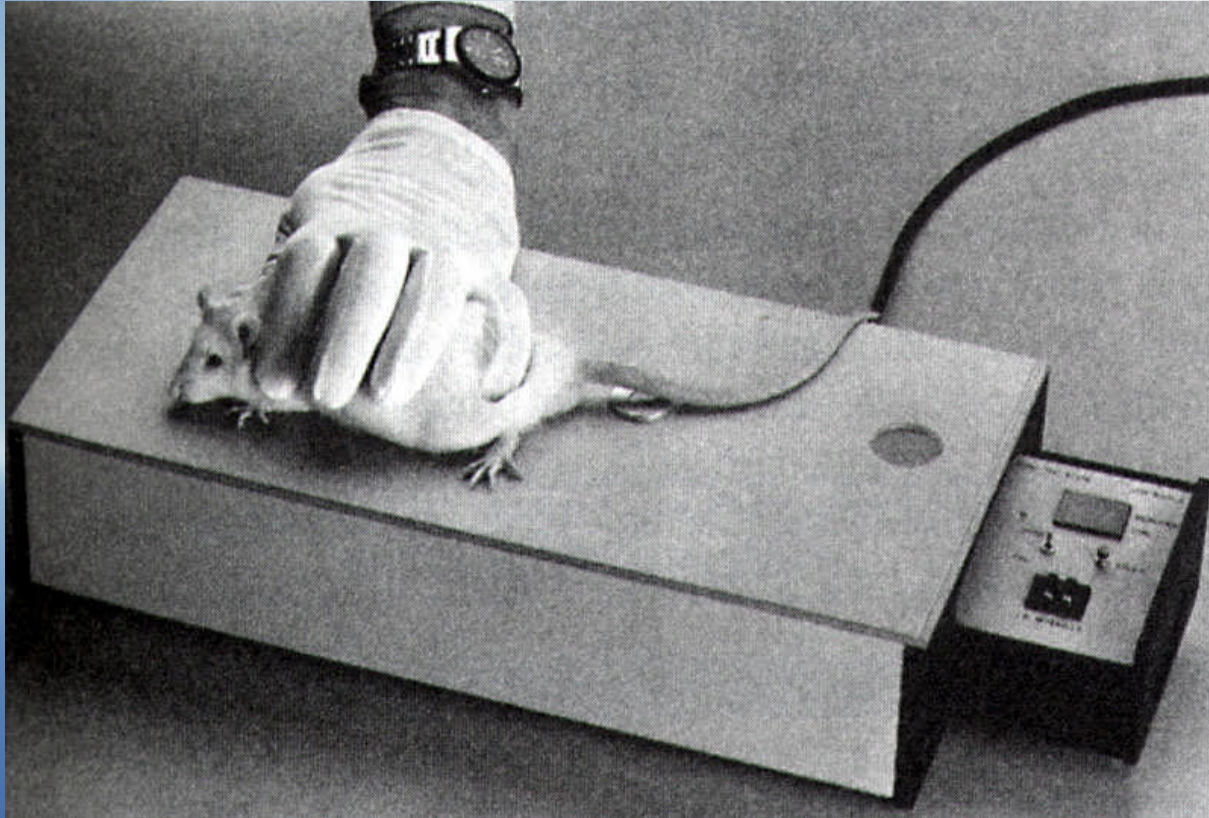


Panepinto sling



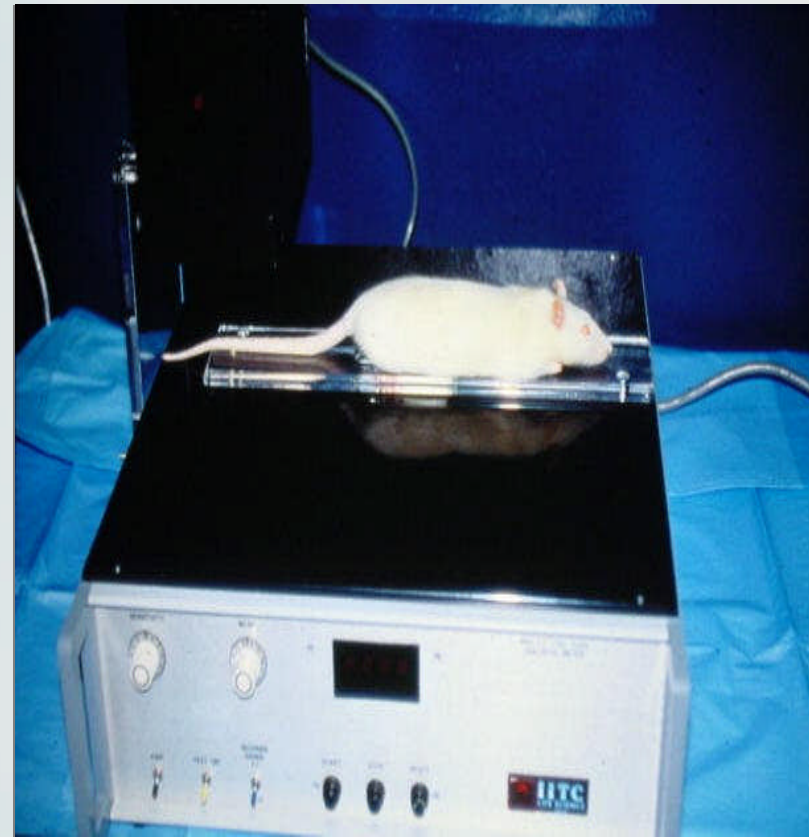
swine restraint device.

Tail Flick Analgesia Instrument

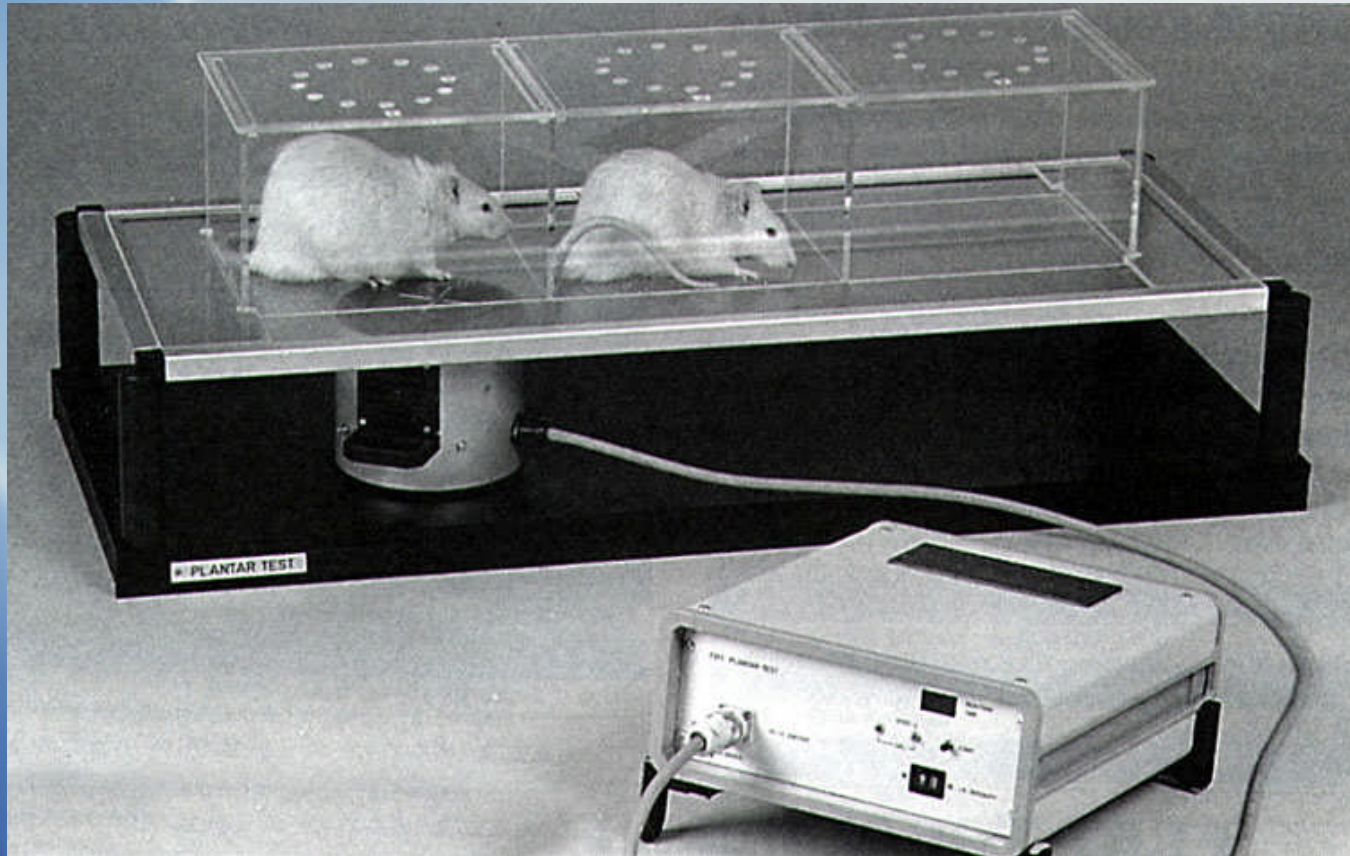


Test for analgesic affects; rodent's tail is placed over window on platform while being restrained. Intense beam of light is applied to the tail (60 – 170° C) and latency period is measured until tail is flicked out of the light beam.

Tail flick Analgesia Instrument

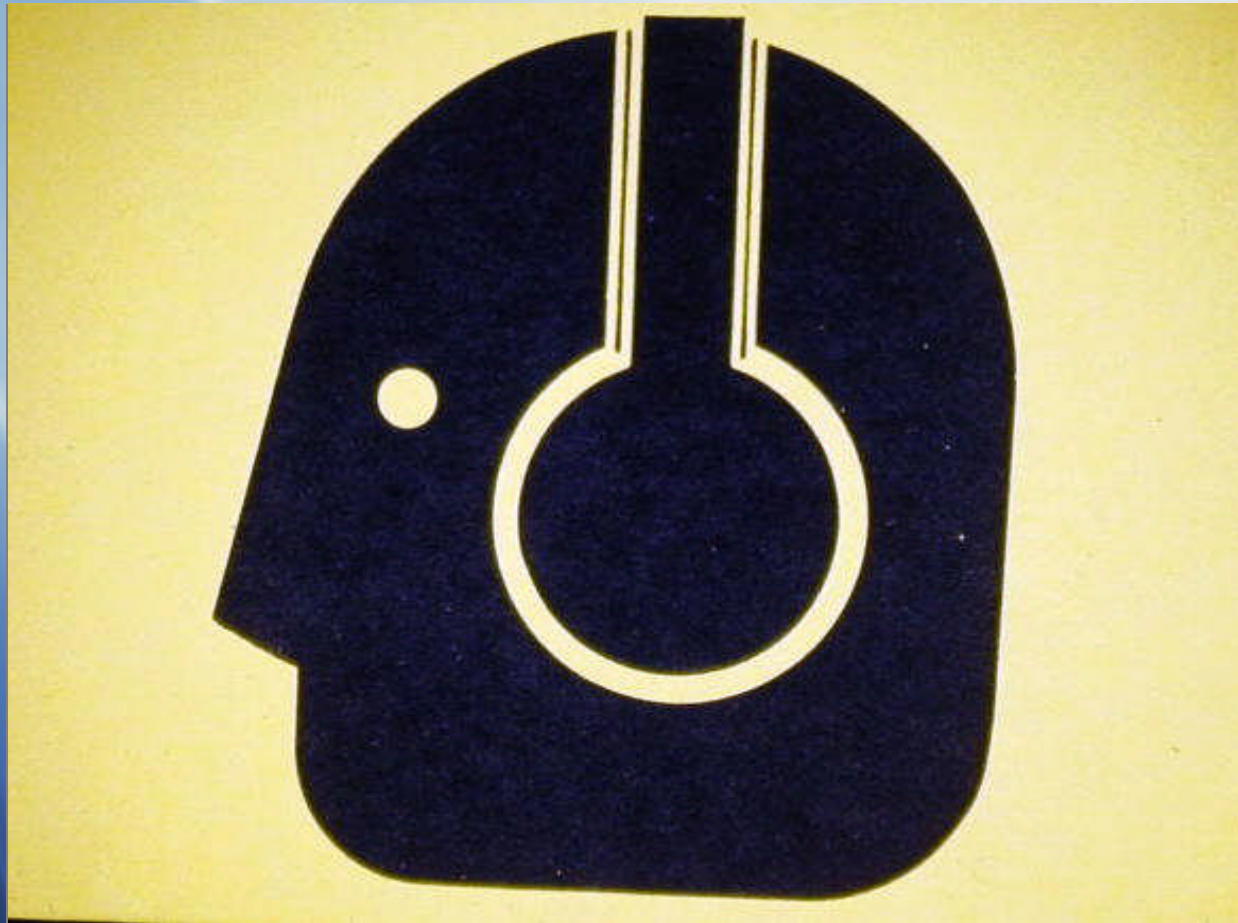


Plantar Analgesia Instrument



Measures paw sensitivity to heat stimulation similar to Hot Plate test, however, animal is unrestrained & heat is applied to bottom of single foot after animal is at rest. Repeated testing does not result in sensitization.

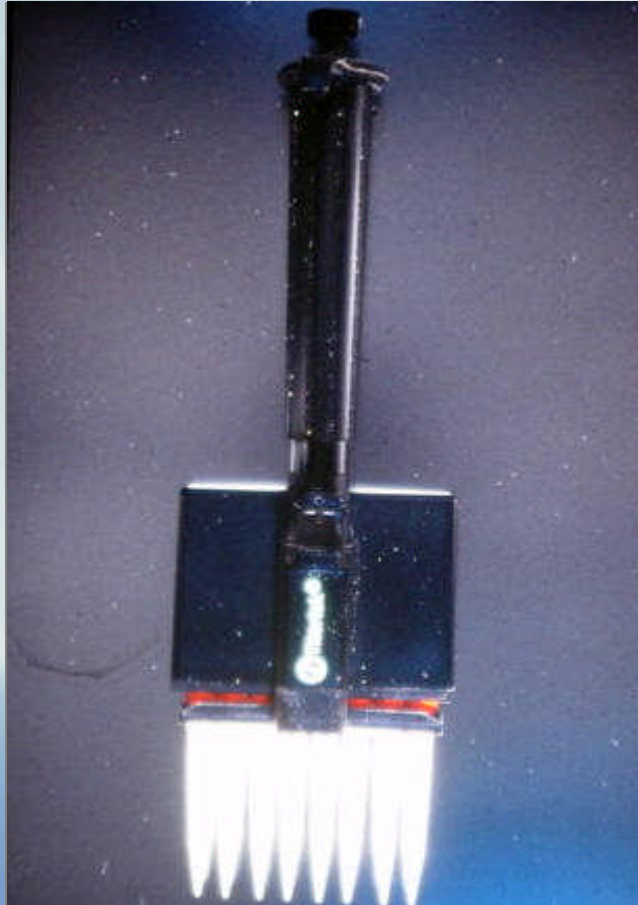
Hearing protection required



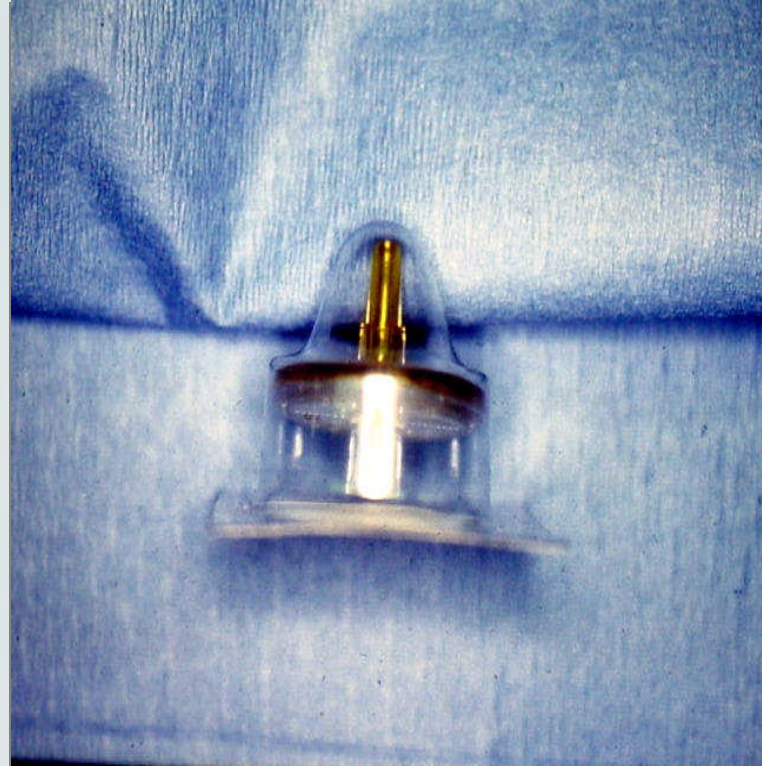
Coral (NHP housing)



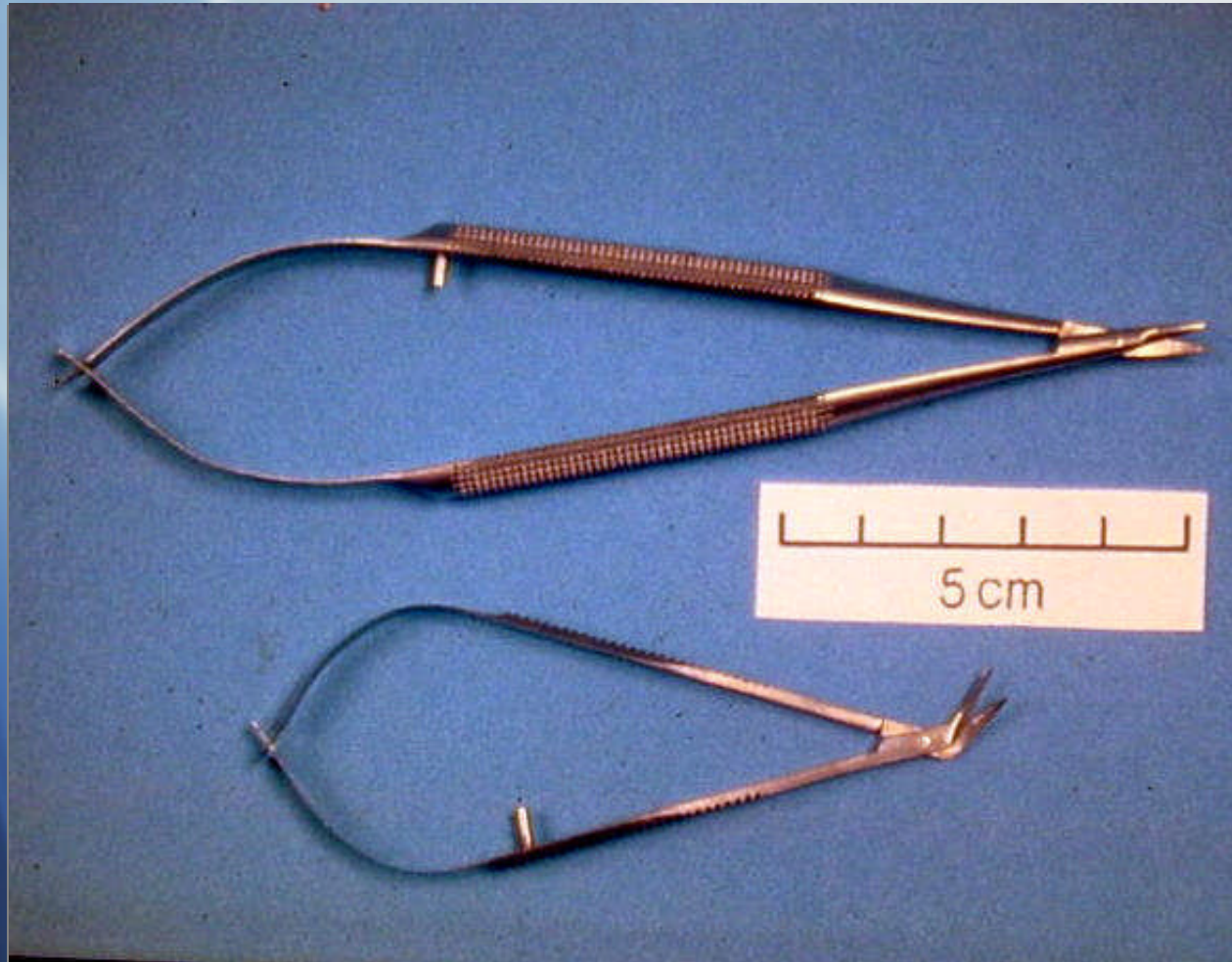
Multichannel pipetter



Syringe filters



Microvascular scissors



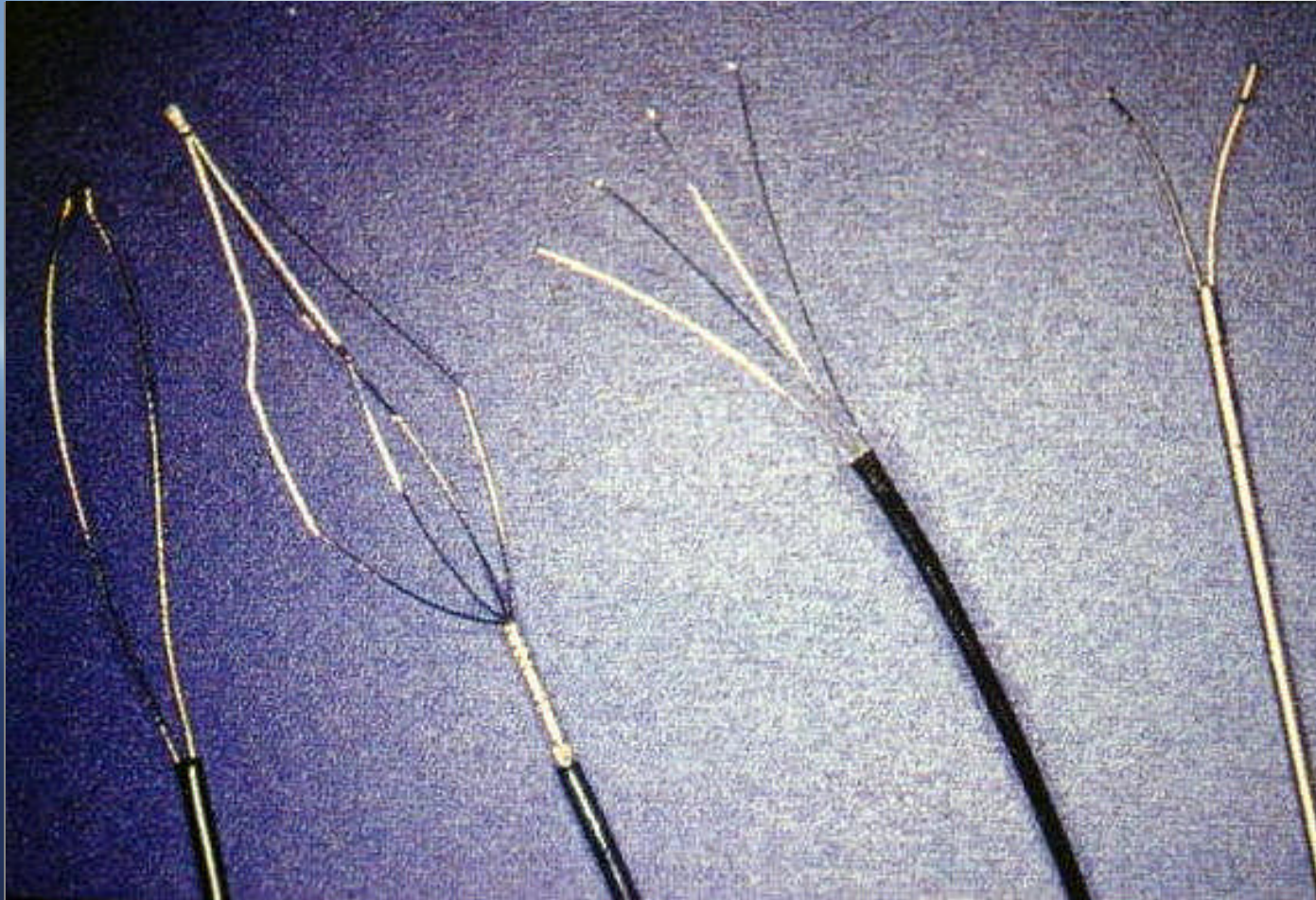
Autoclip, wound clips or staples & wound clip remover



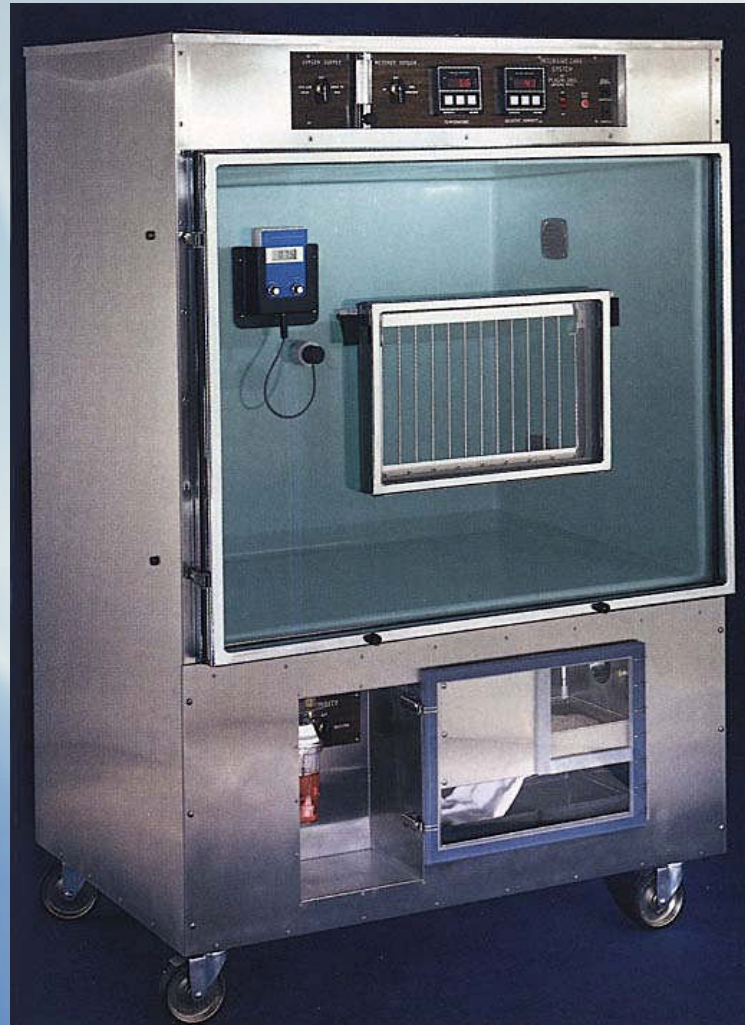
***Baby Dieffenbach (Straight & Curved):
Serrefines micro Bulldog clamps***



Foreign body forceps for endoscope



Intensive Care Unit / Critical Care Unit

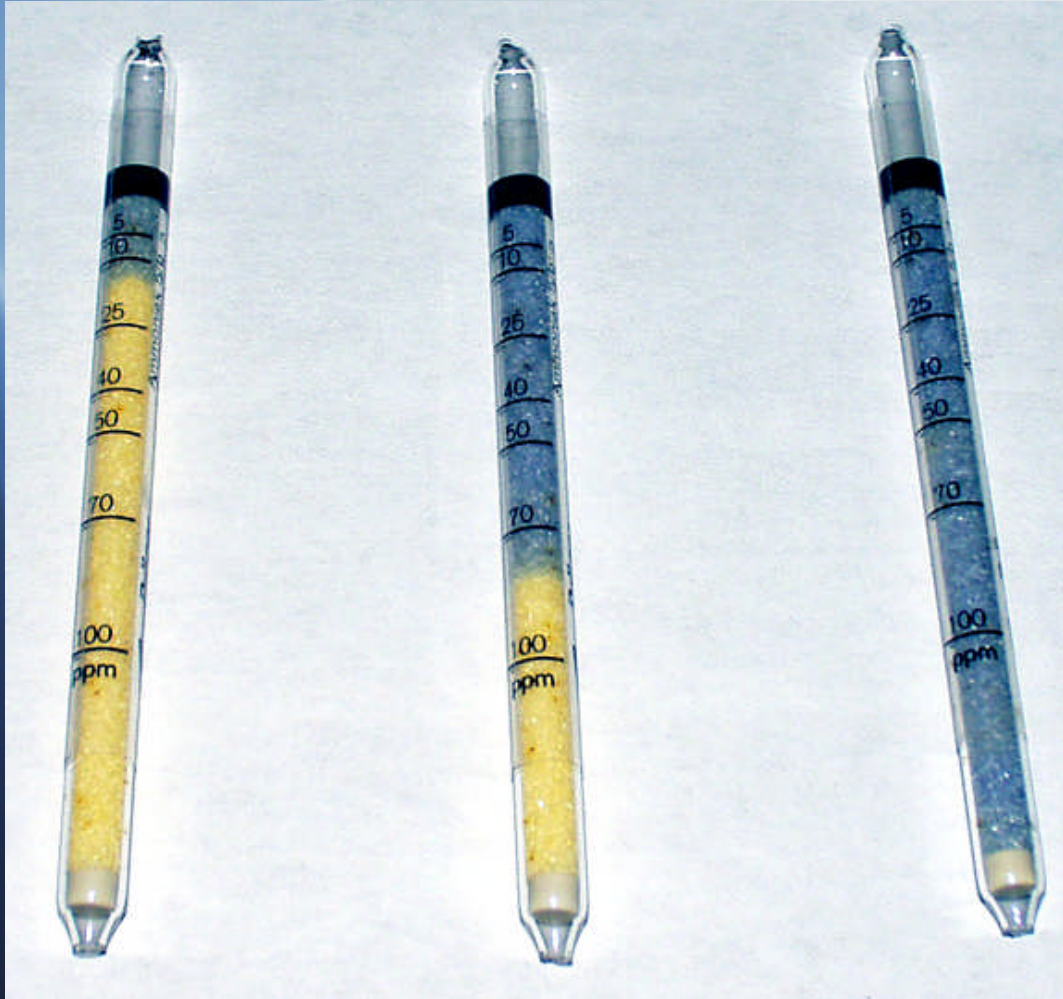


Bowie-Dick Test Card (DART – Daily Air Removal Test)



Used to test vacuum of steam autoclave.

Dräger Tubes



- Used for detection of environmental ammonia.
- Blue color change indicates ammonia level in ppm.
- The first tube is within the 25 ppm standard, but 2nd and 3rd tube far exceed 25 ppm.



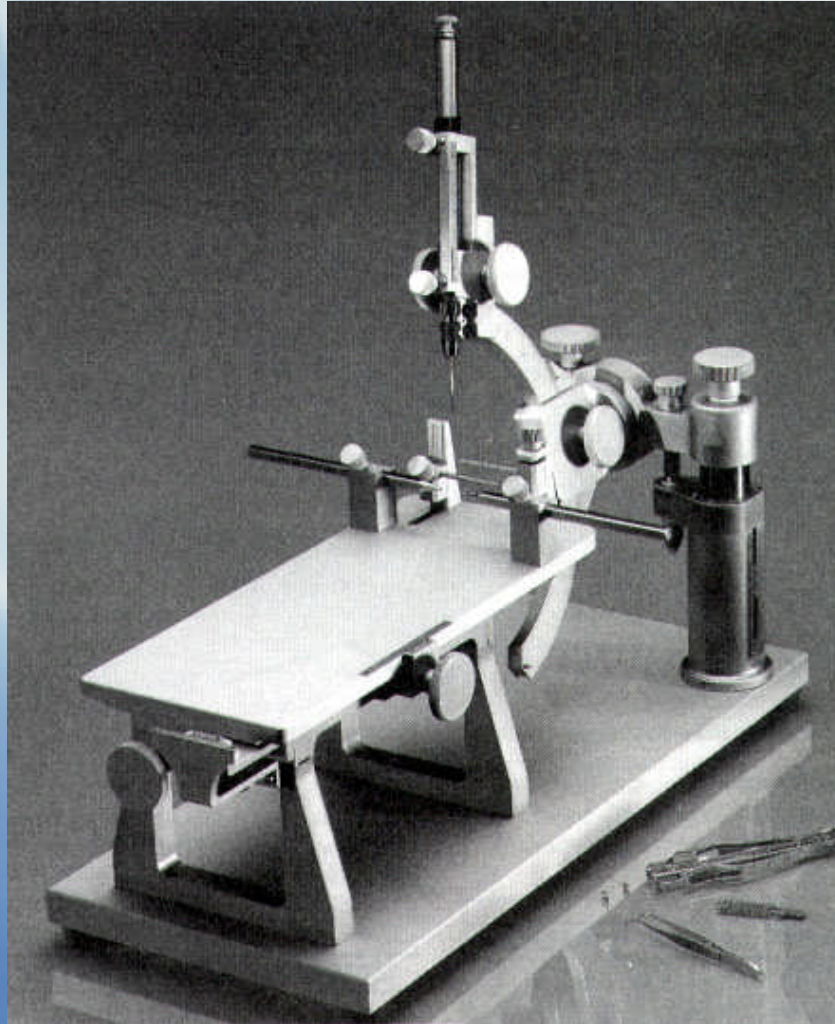
PAPR

(Powered Air Purifying Respirator)

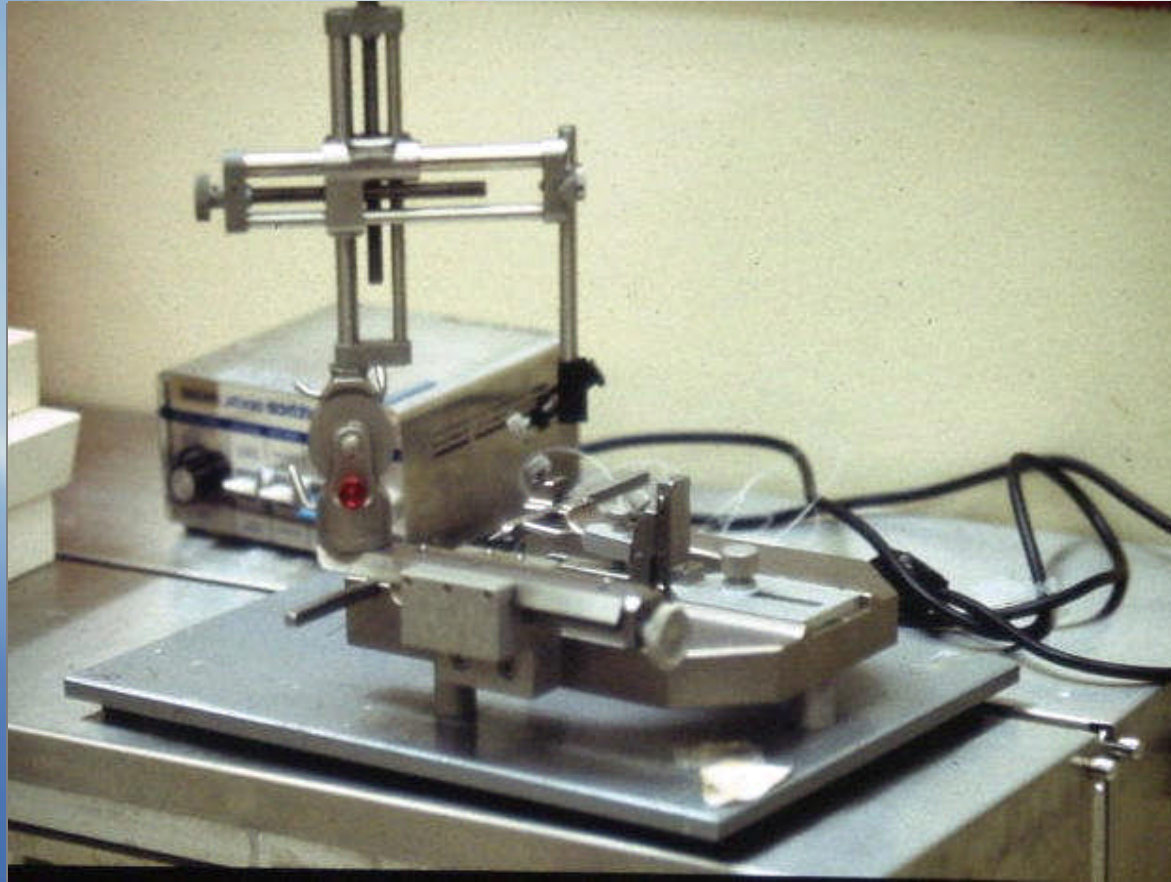


Racal hood provides HEPA filtered air supply when working with BSL-3 agents.

Rat Stereotaxic Apparatus



Stereotaxic w/ microdriver



Plexiglass shield for radioactive work



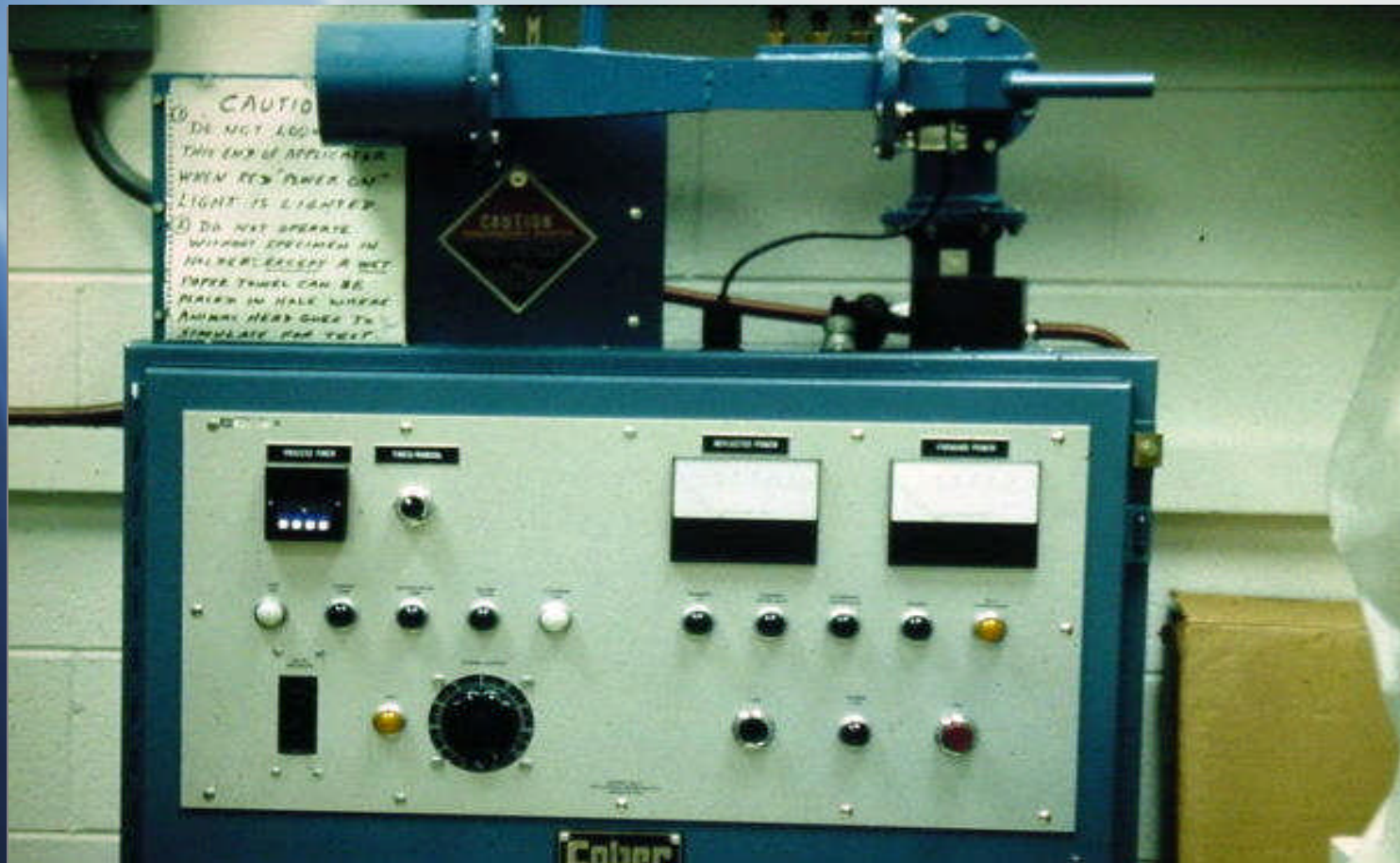
Microwave Oven



Used to warm fluids or heat packs



Microwave for euthanasia



Hamilton Thorne – Ivos Sperm Counter



GSKRTP Summary Report 03/27/2004 14:05:04
3254-54 (Animal # P0300)

SPECIMEN INFORMATION		1.0	Sample/Diluent	1.0.0
Volume		0.0000		
Tissue Weight(g)				
Line				
Construct				
Pedigree #	93			
Birthdate	10/27/03			
Age	3 MO			
Background	C57BL/6			
Generation	N2			
Genotype	TG ⁺			

NOTES

COUNT SUMMARY				
Category	Cells Counted	Sample (M)	Concentration (M/ml)	Percent
Total	526	20.9	20.9	100
Motile	267	6.0	6.0	29
Progressive	14	0.3	0.3	2

Standards				
Parameter	Actual Value	Standard	Units	Status
Total Conc.	20.9	20.0	M/ml	Pass
Motility	29	70	%	Fail
Rapid Cells	2	50	%	Fail
Sperm/gram	0.0		M/g	



Ivos Sperm Counter

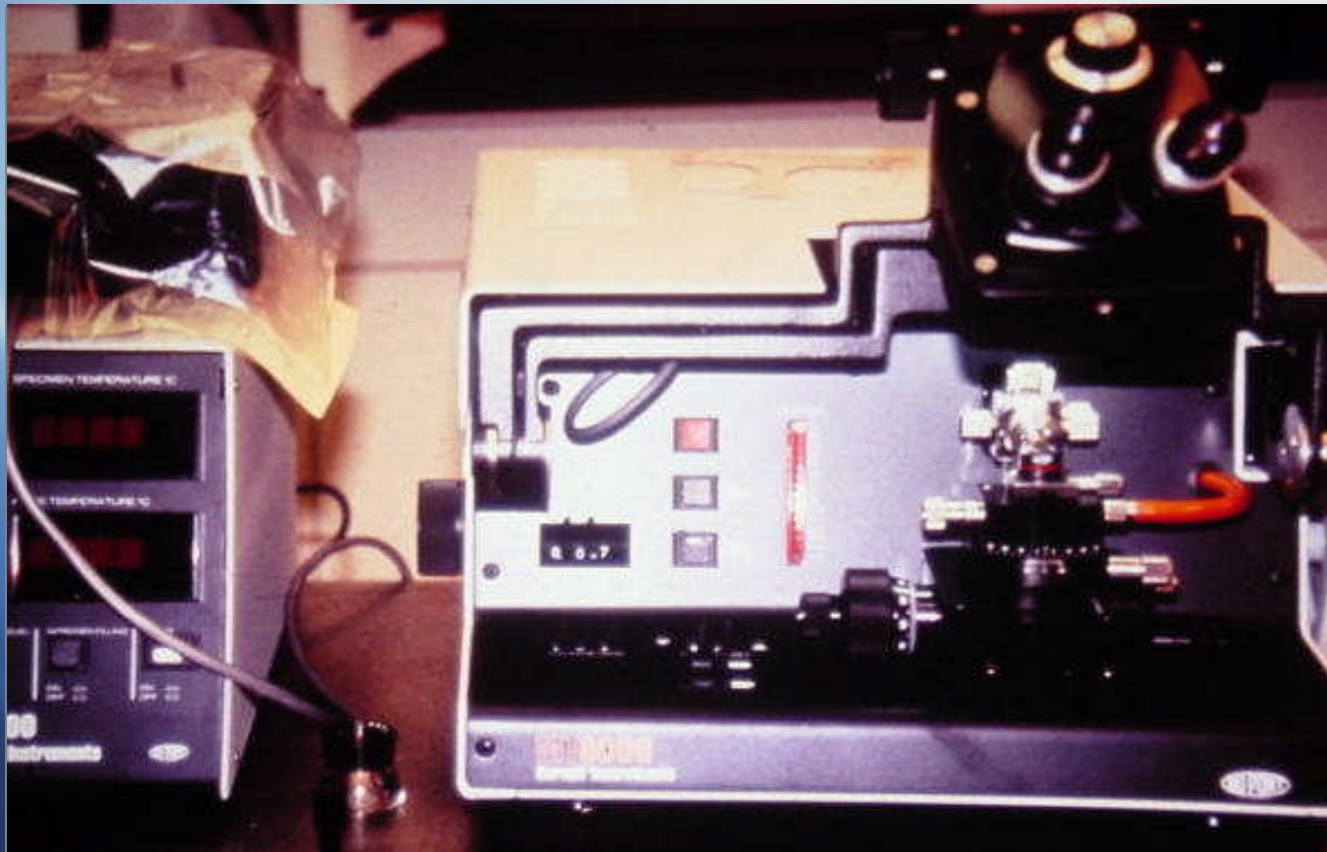


Cryostat

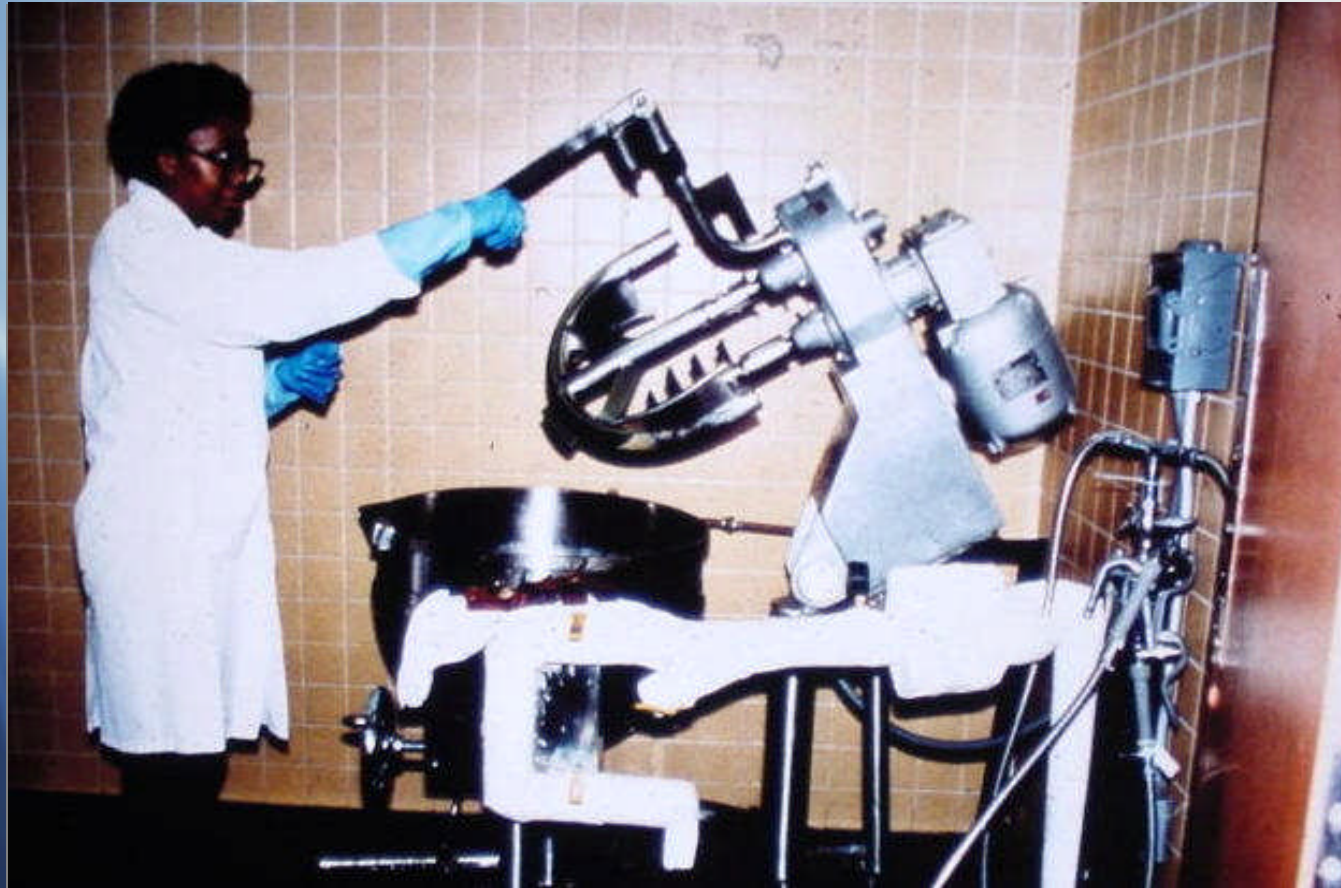


Cryostat microtome

Red tube = liquid nitrogen



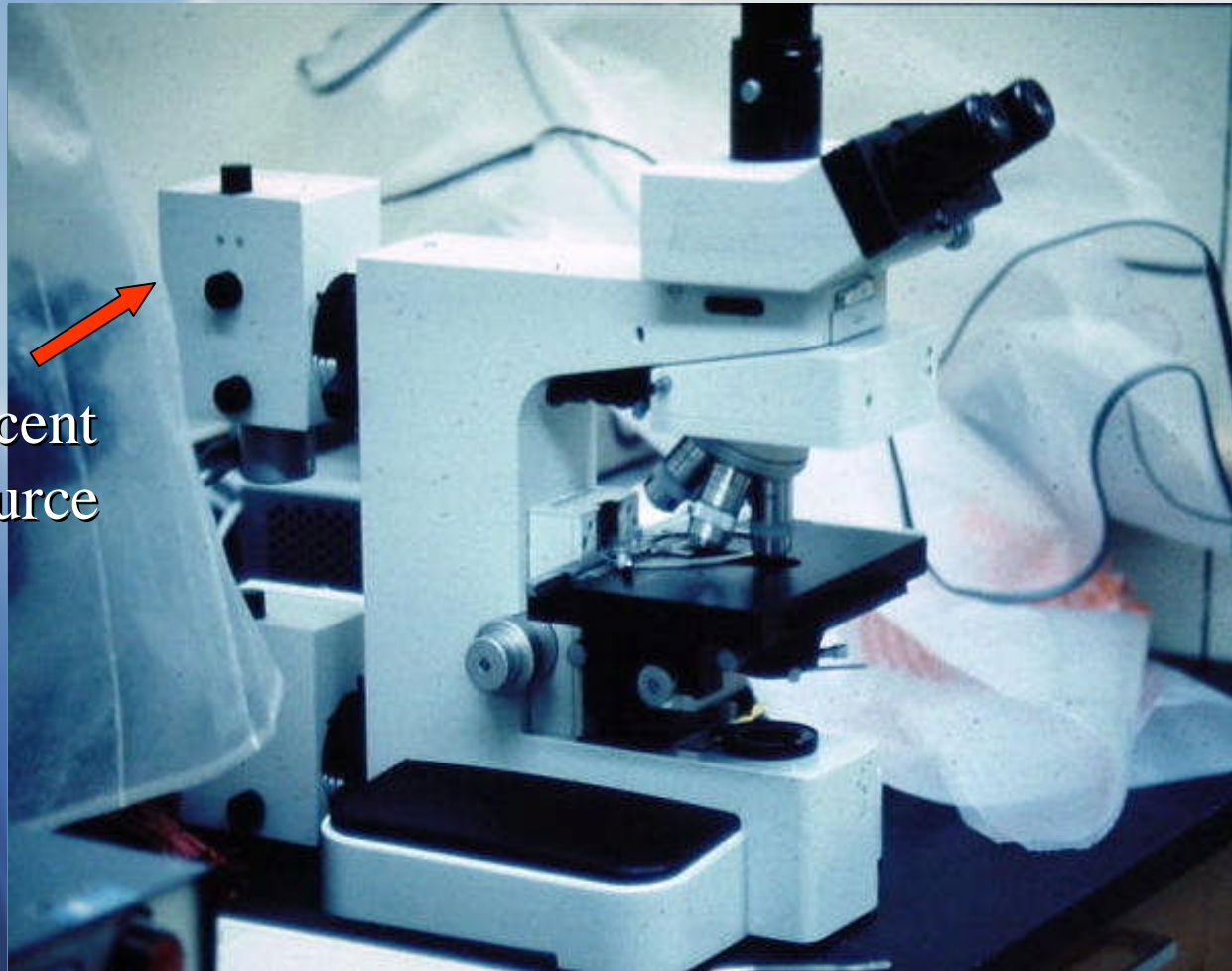
Feed Mixer



H₂O Deionizer w/ blue filter



Fluorescence microscope



Fluorescent
light source

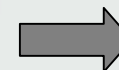
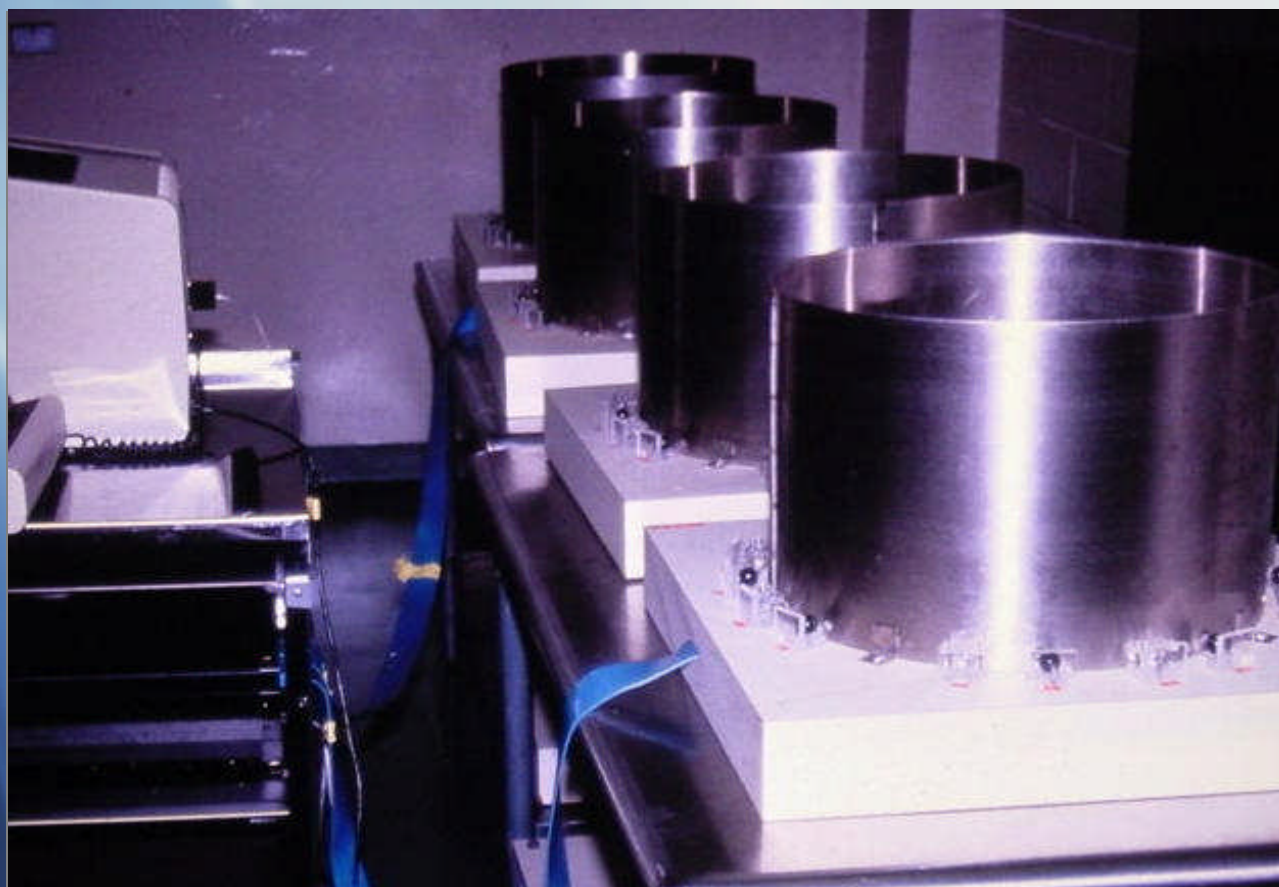
Phase-contrast scope



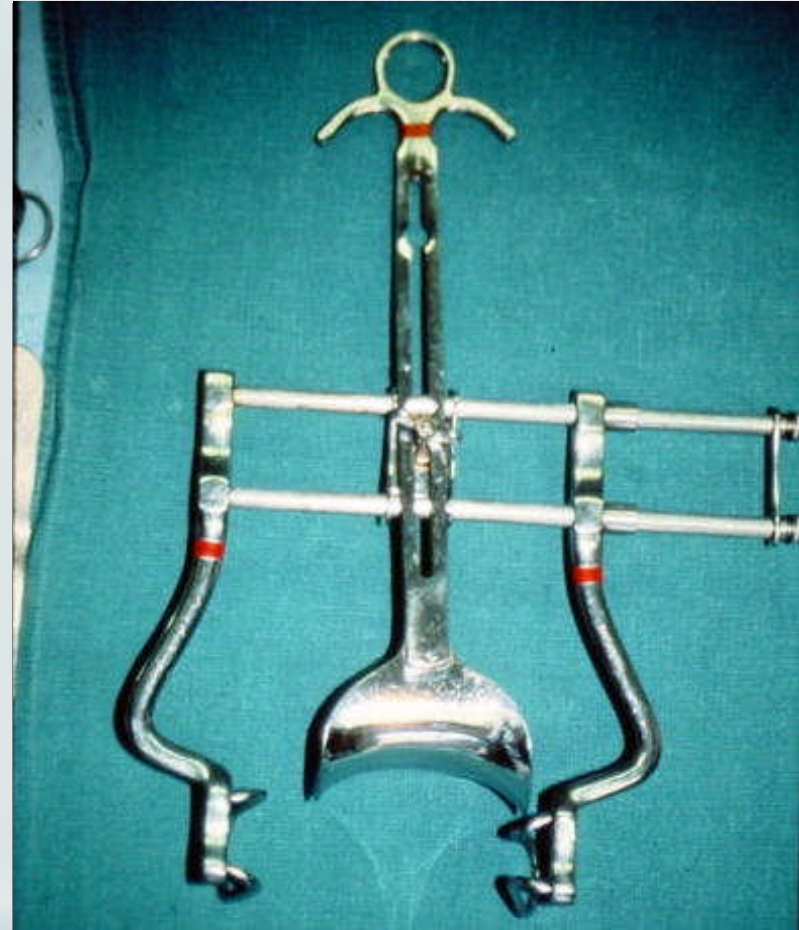
Bird respirator



Rodent activity chambers



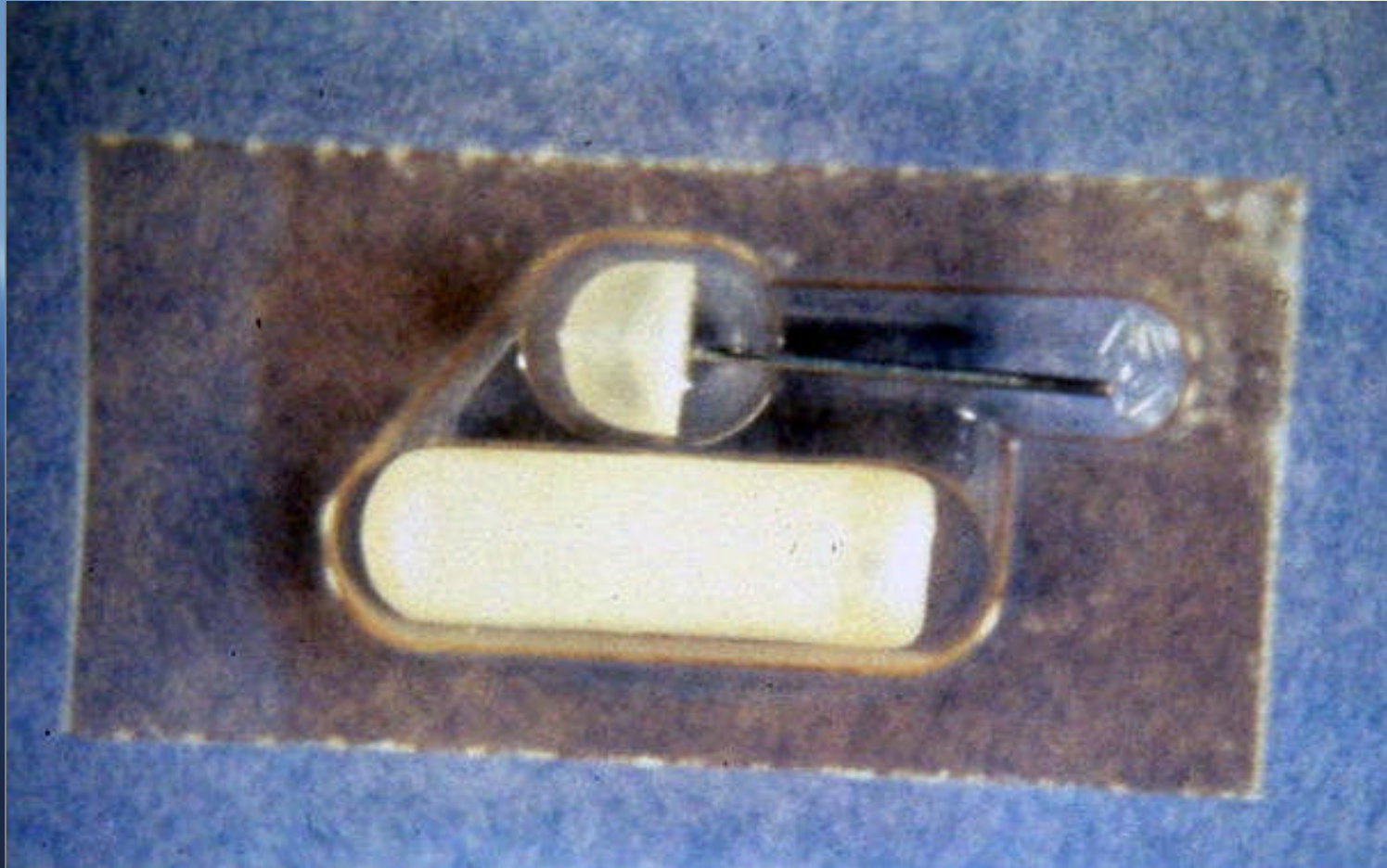
Balfour abdominal retractors



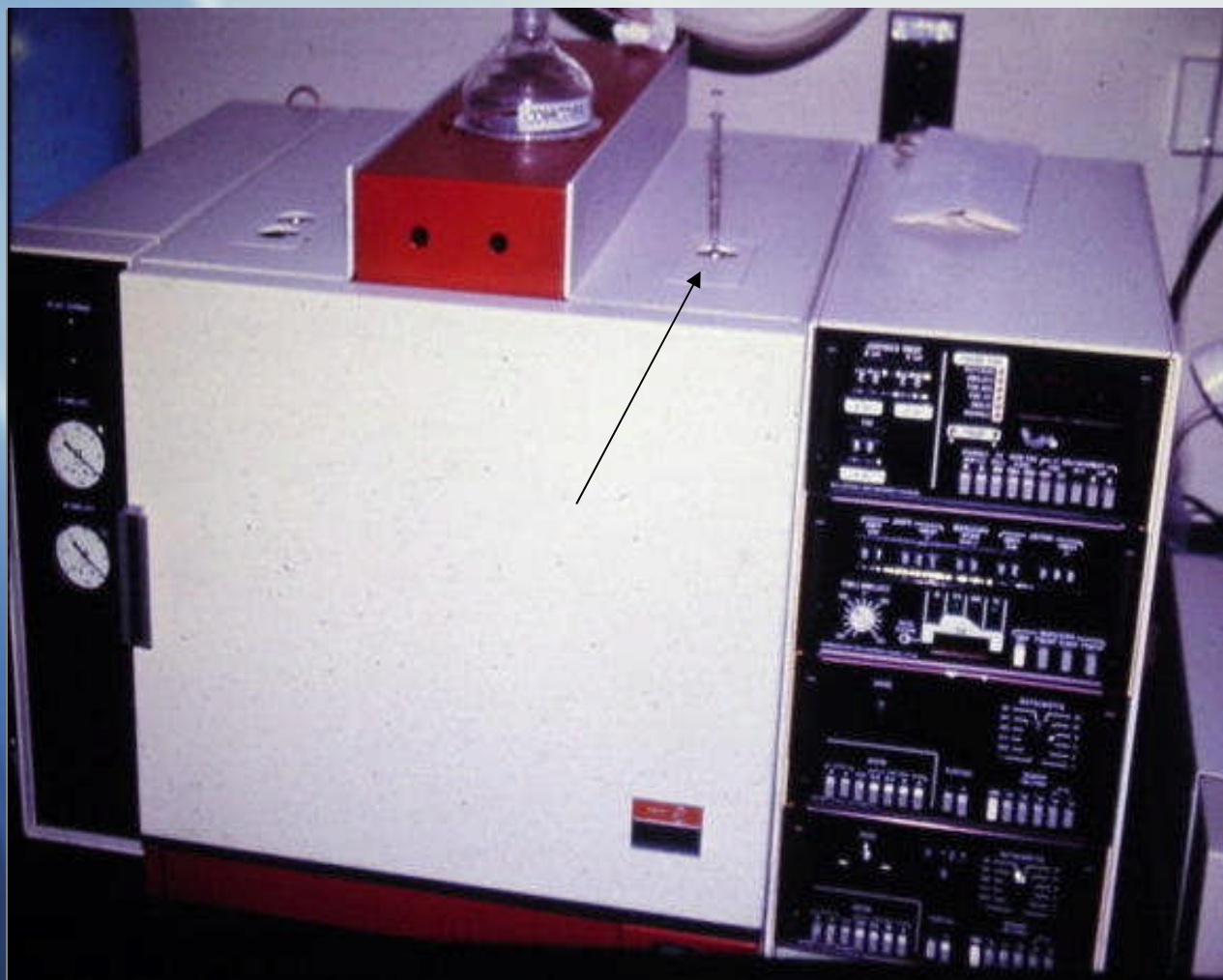
Analytical balance



Alzet osmotic pump



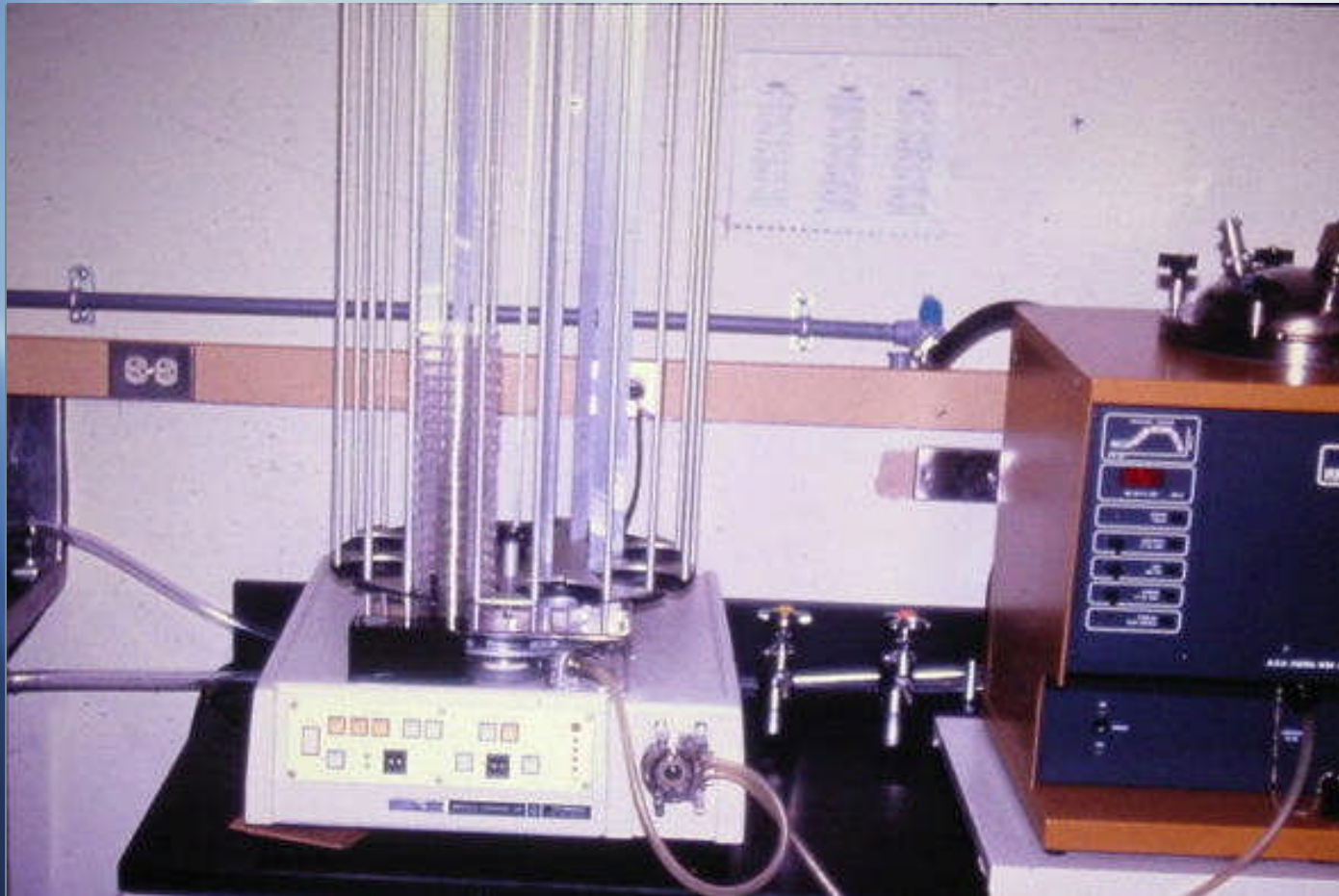
Gas Chromotograph



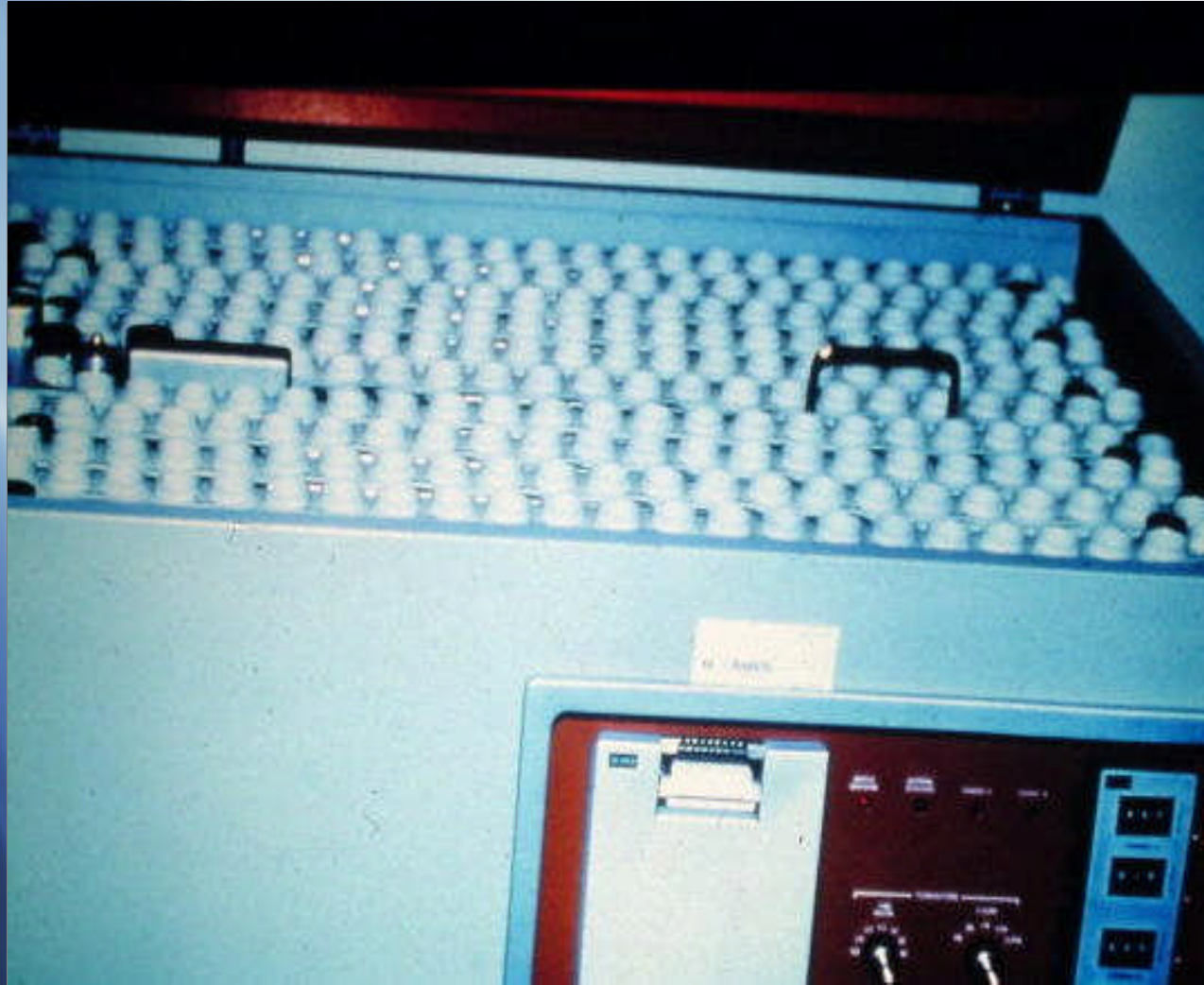
Feed blender



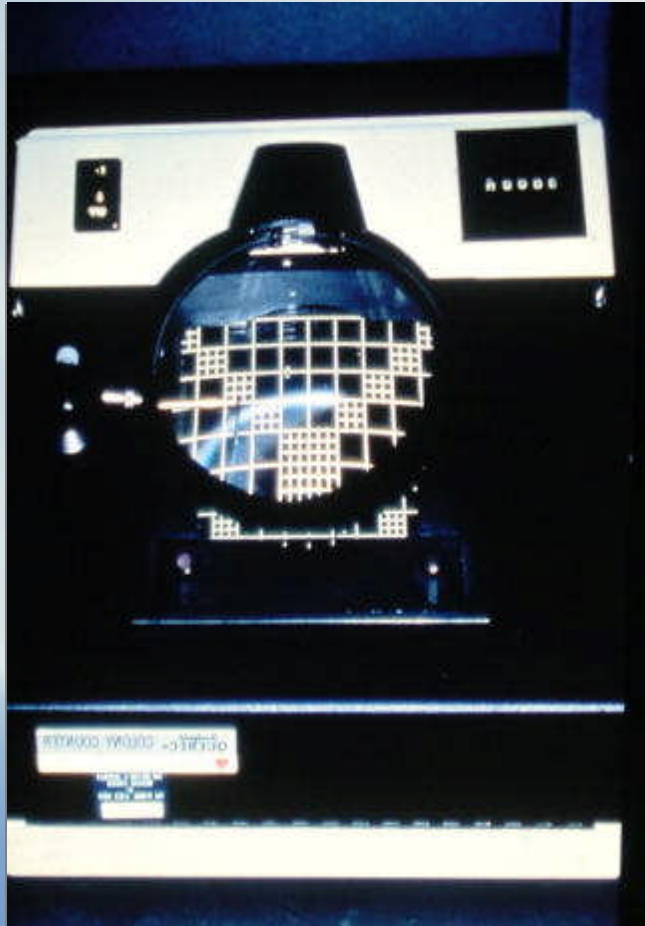
Agar dispenser to fill agar plates



Gamma counter



Quebec colony counter



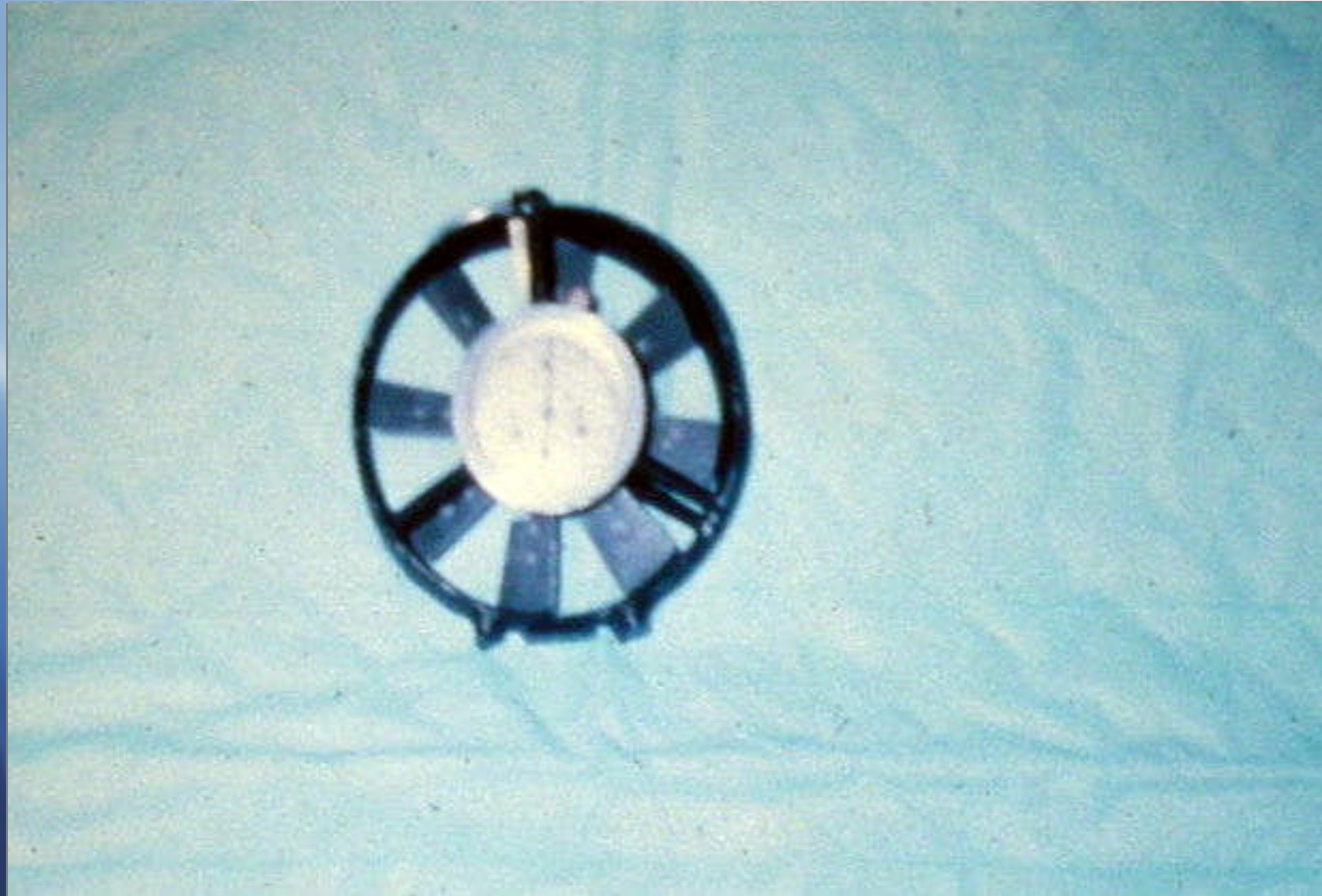
Pitot tube air velocity



Smoke generator



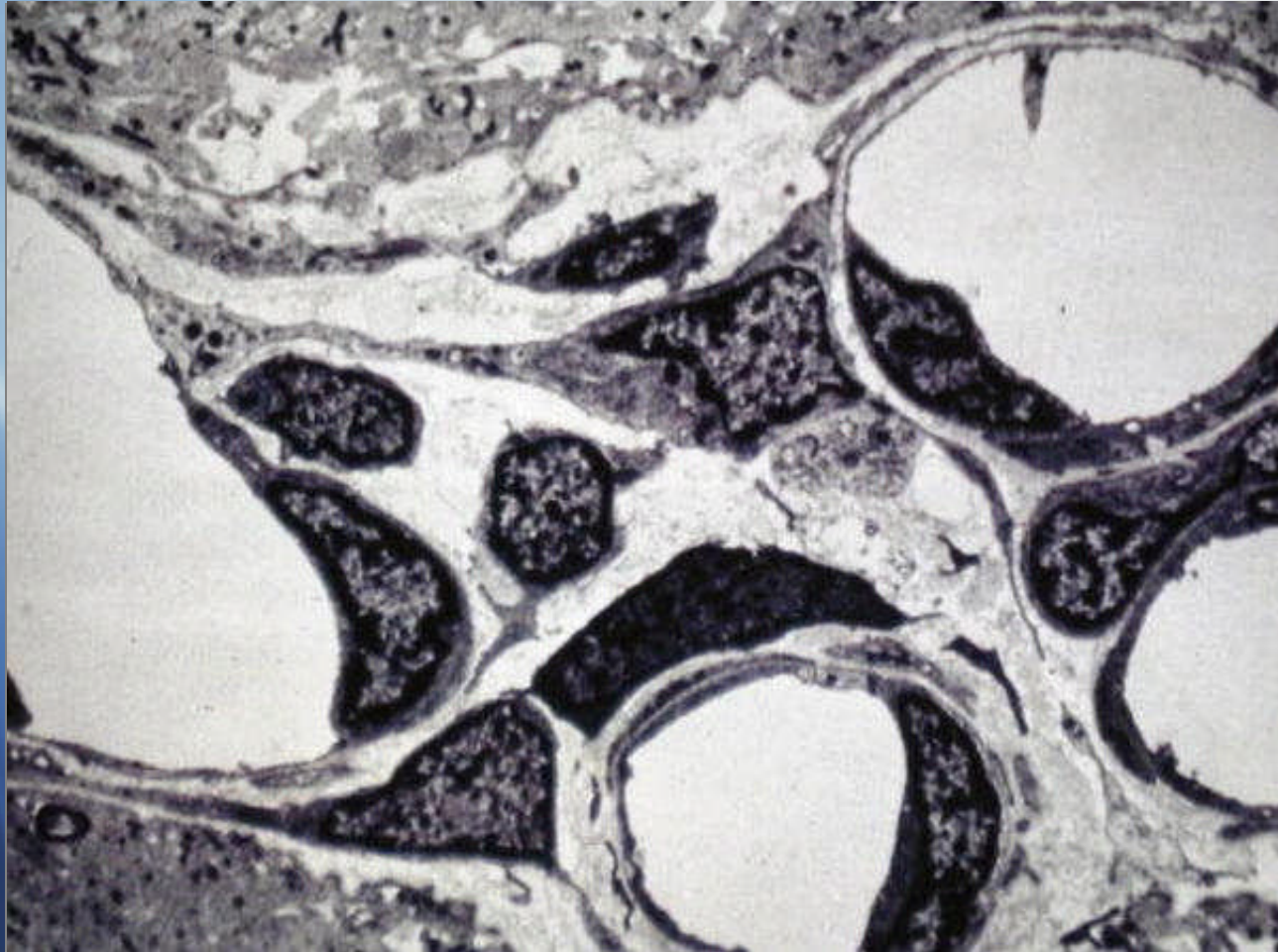
Vaned anemometer\air velocity



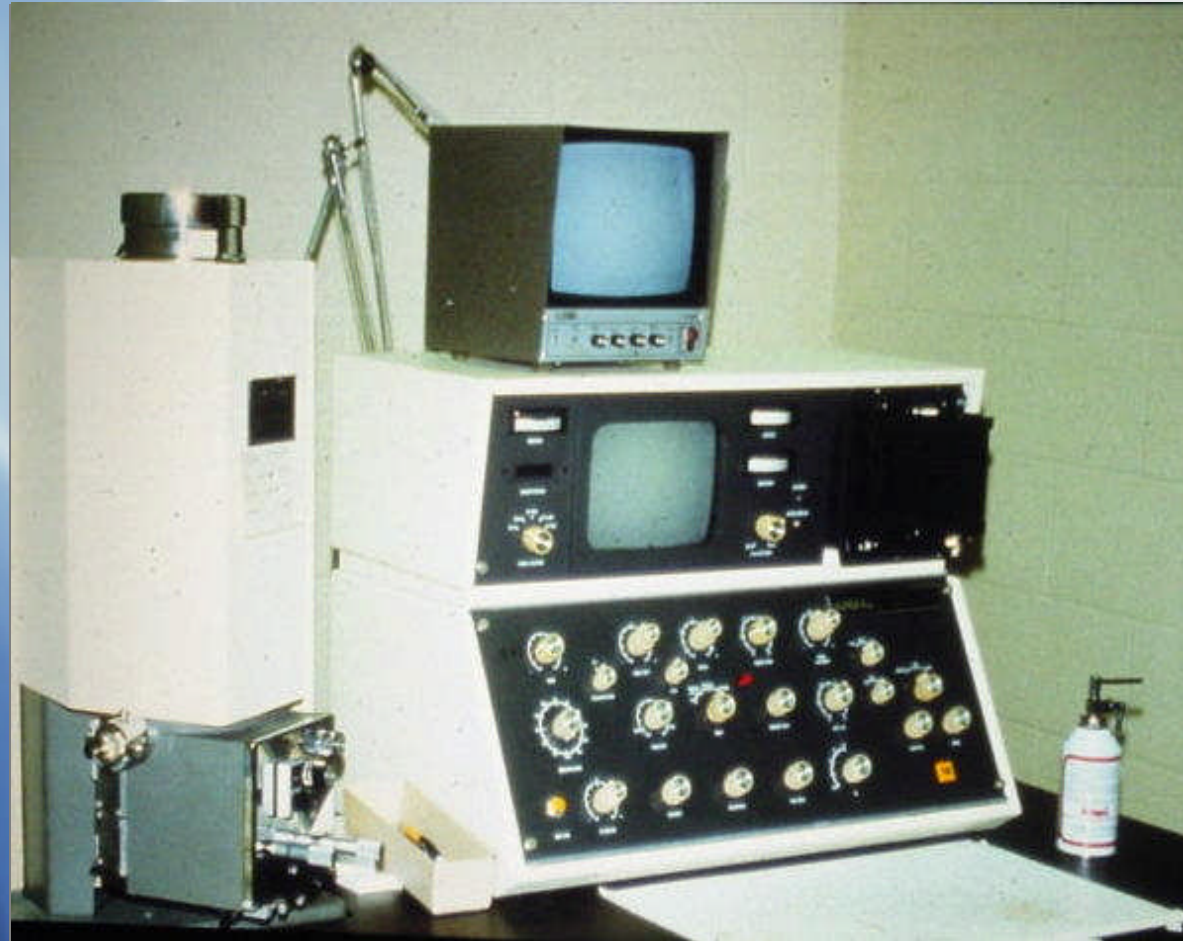
Thermo anemometer air velocity



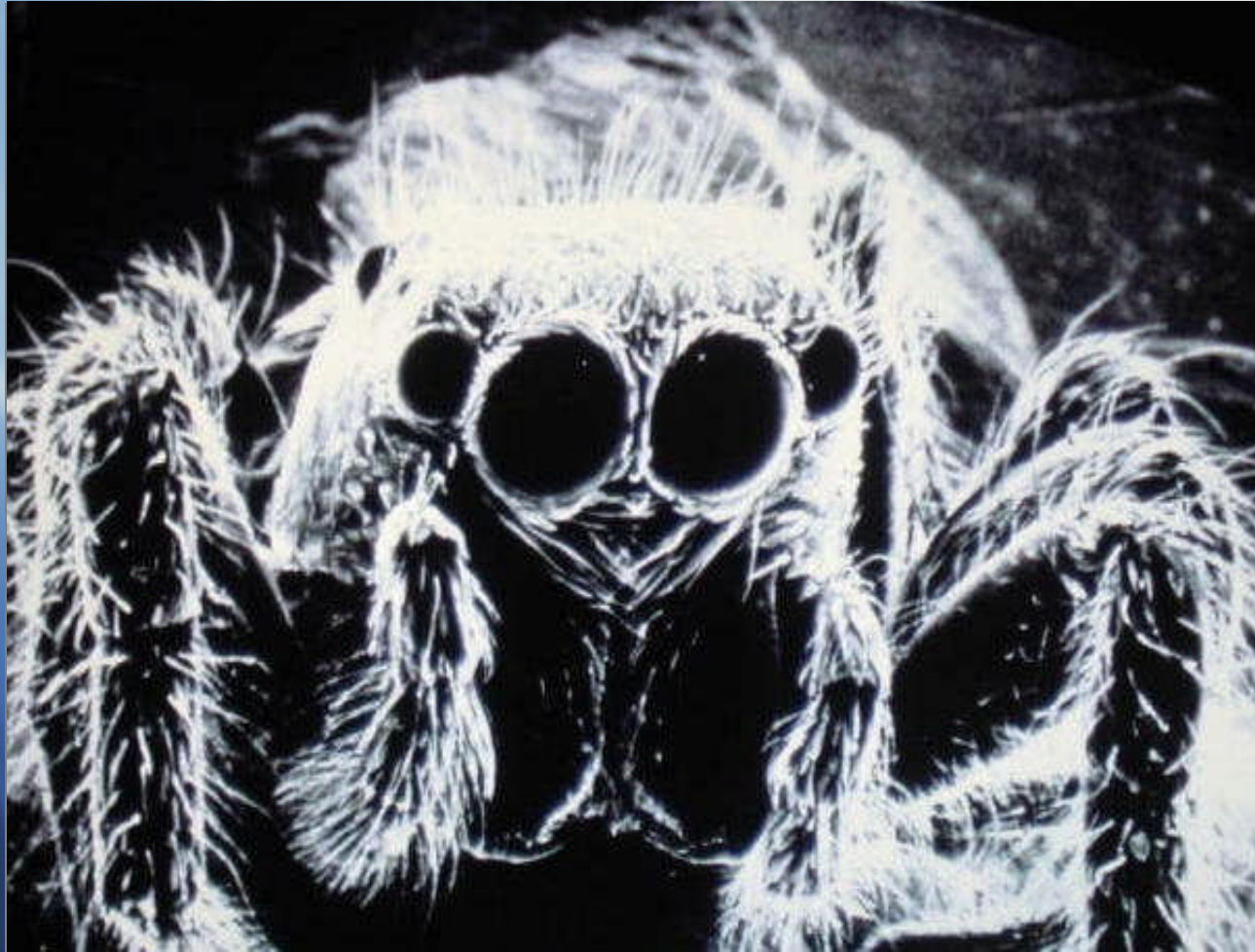
Transmission EM



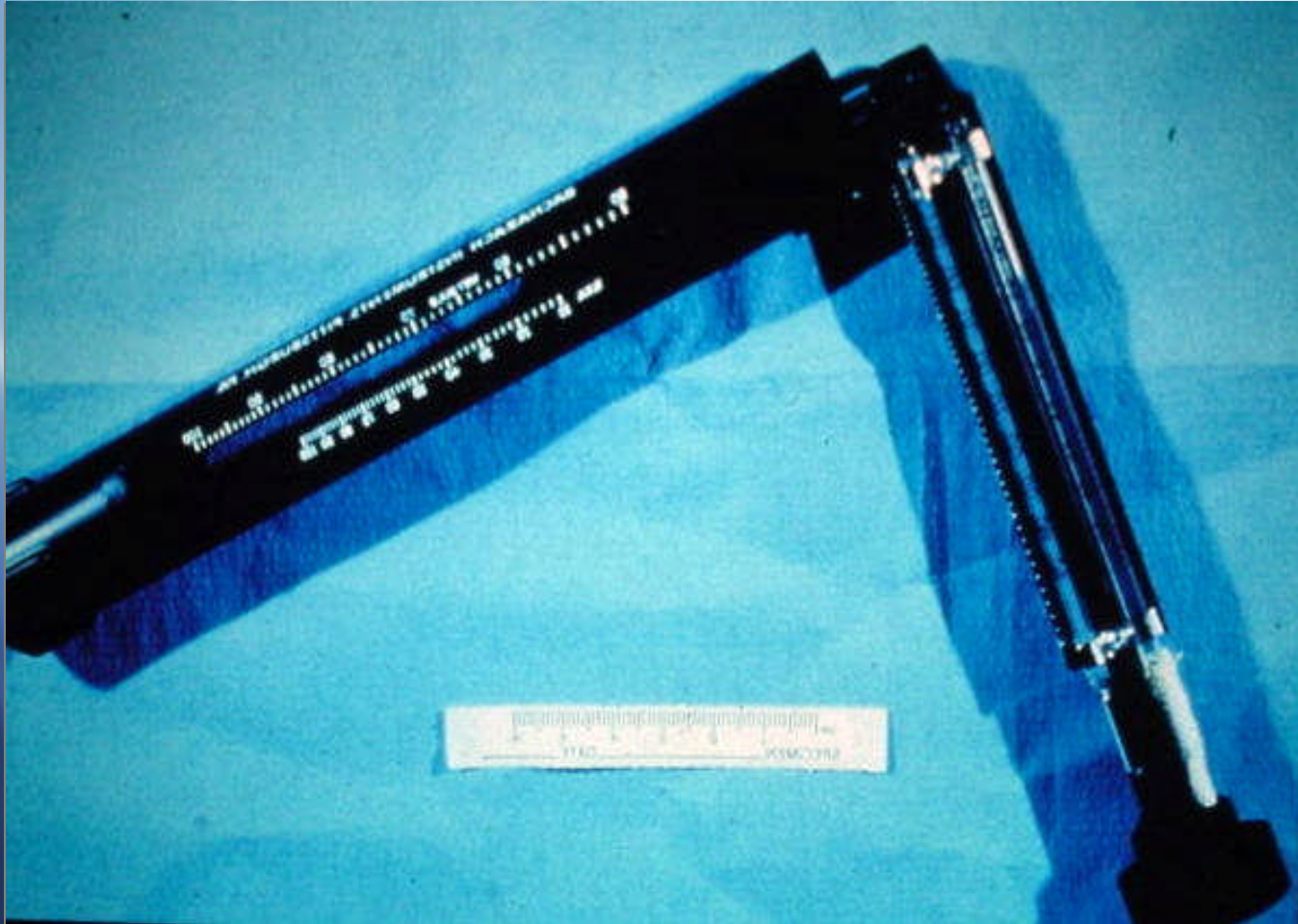
Scanning EM



Scanning EM

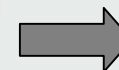
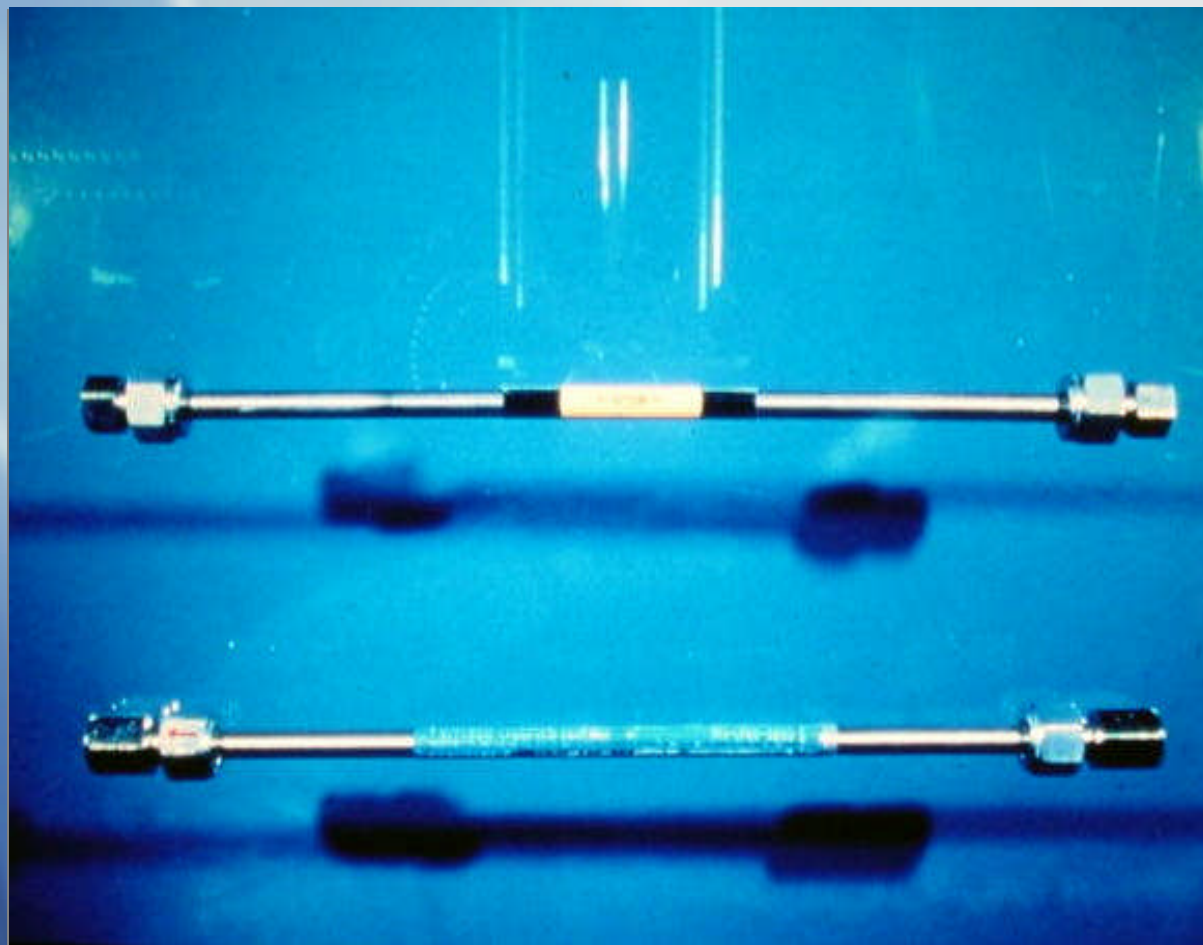


Sling Hygrometer



HPLC

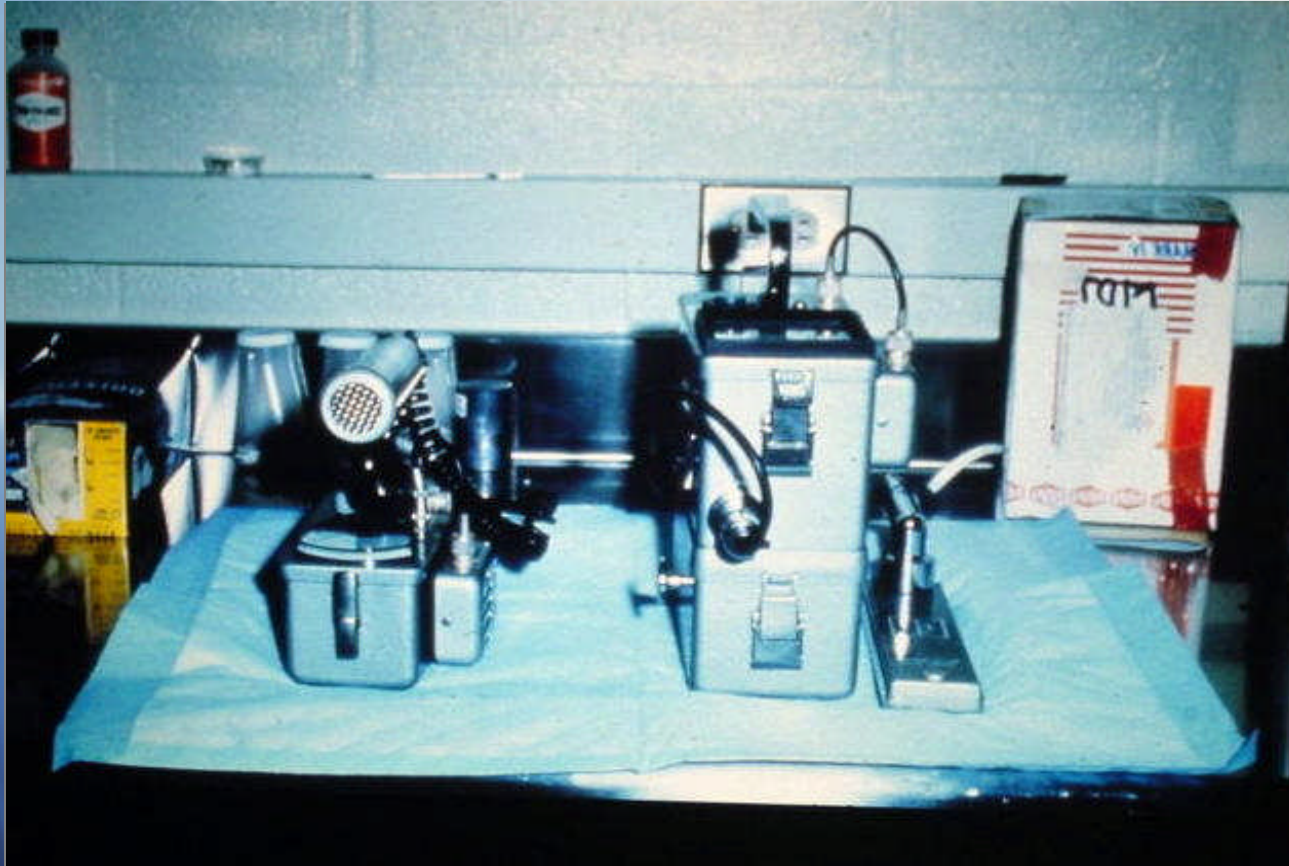
High pressure liquid chromatography



Lixit with filters



Geiger counters



Metabolic Stanchion



USDA Tag



- 1 ¼ round or 2 x ¾ rectangular
- 23BJ = state and dealer/exhibitor
- 33412 = individual animal # (established by vendor)
- Keep for 1 year post death
- Can't reuse for 5 years

Ohio ventilator



Smoke tube kit



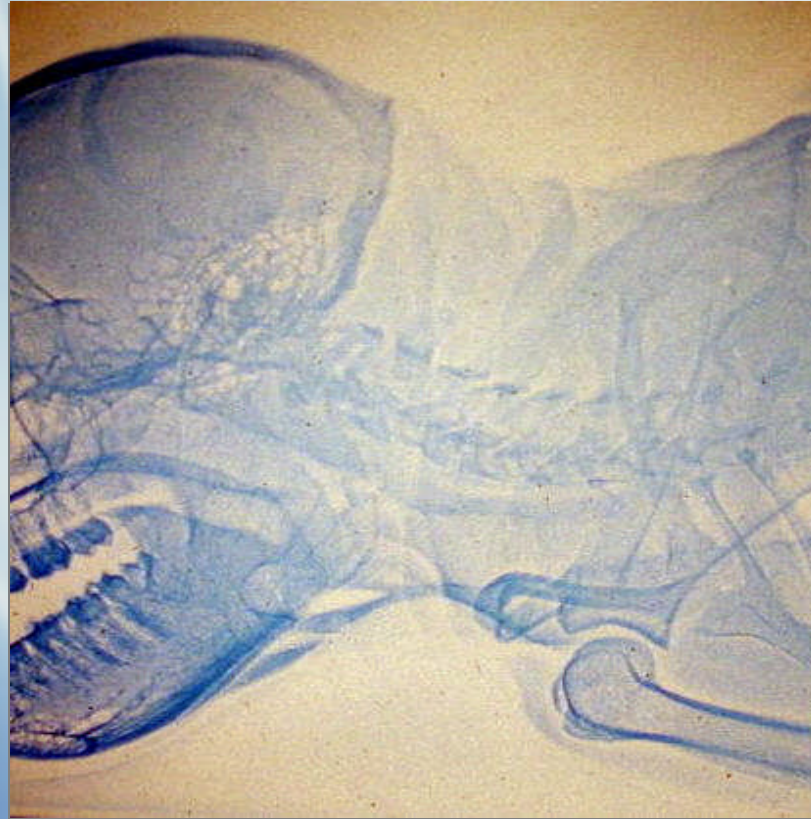
Radiation dosimeters



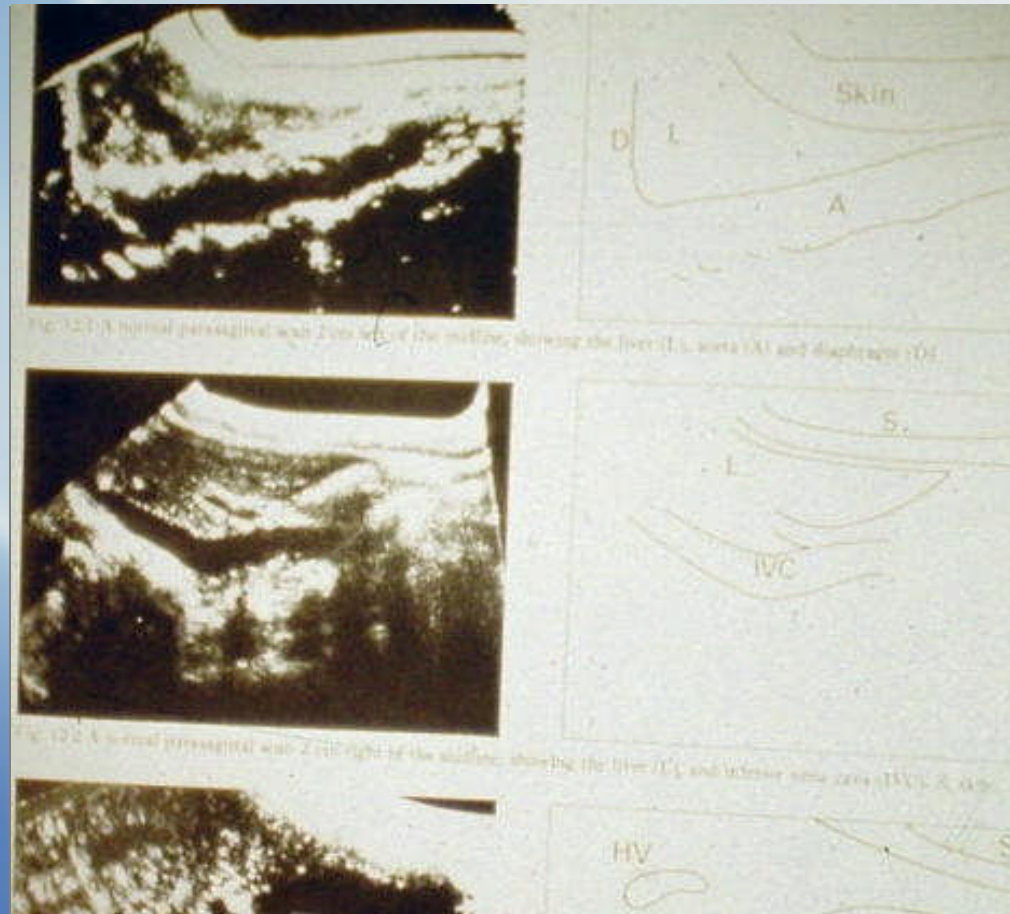
Hygrometer



Xero radiography



Ultrasound



Empty supply cylinders



Supply cylinders (for isolators)



Wrapping supply cylinder



Prepared supply cylinder



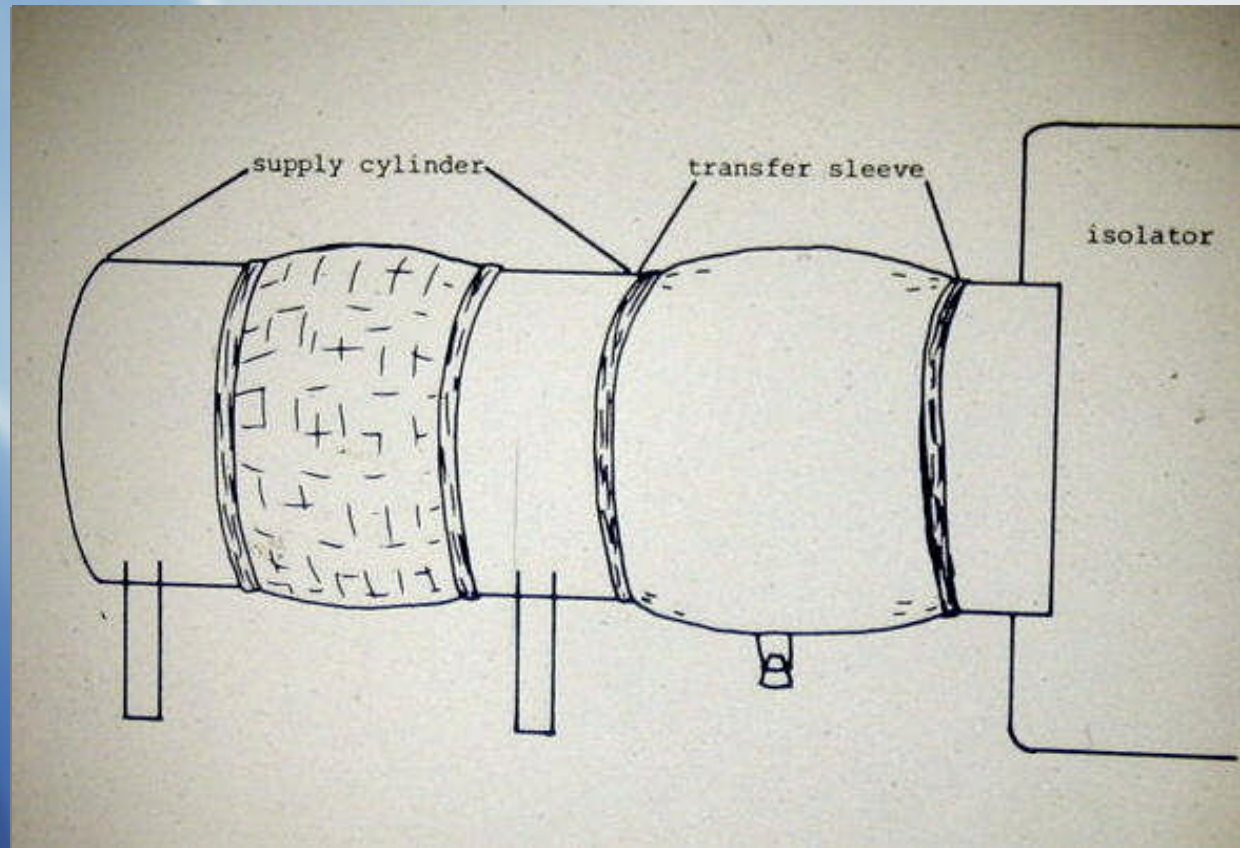
Transfer sleeve being sprayed



Isolator, transfer sleeve, supply cylinder



Diagram of supply cylinder



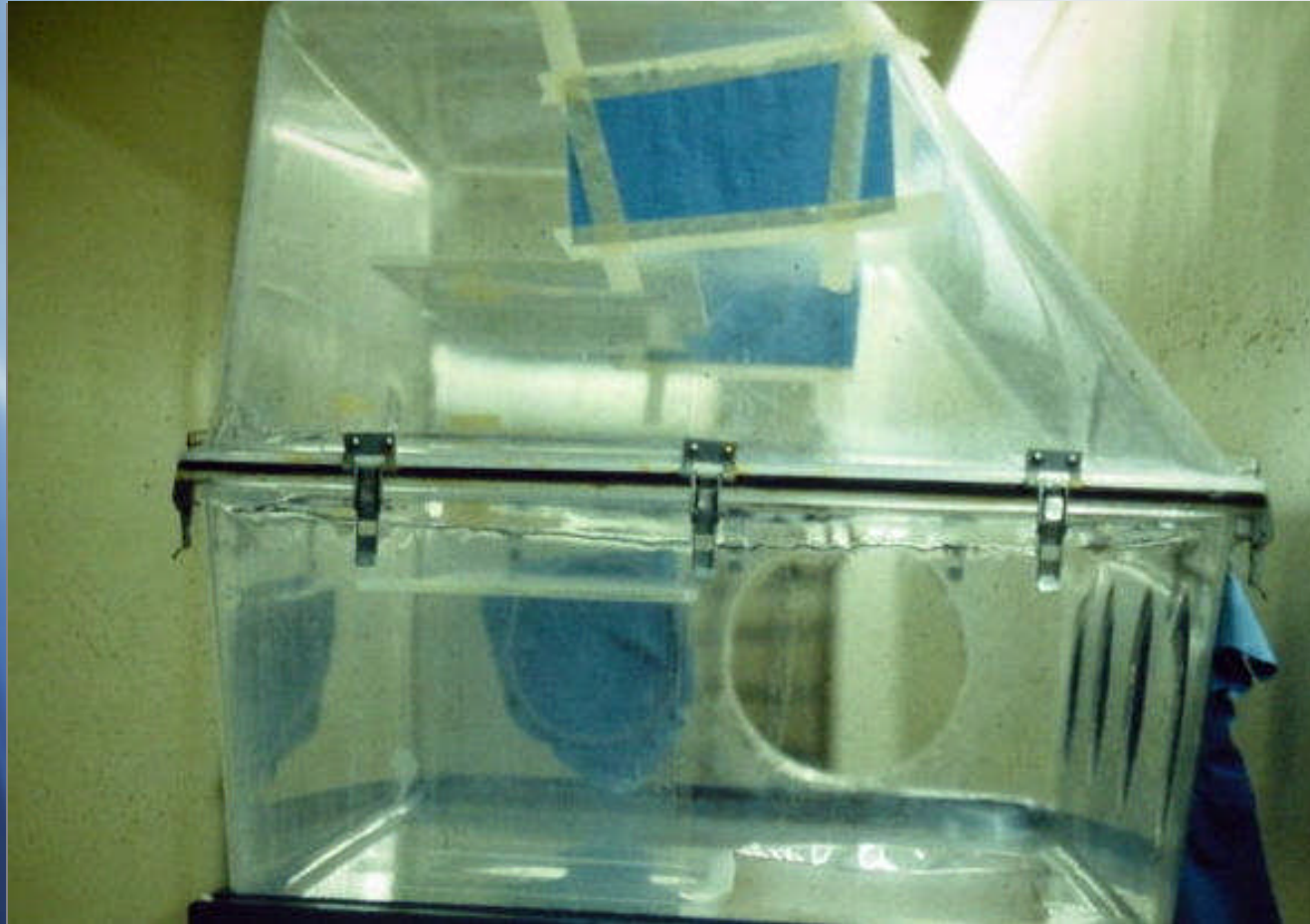
Germ free shipper



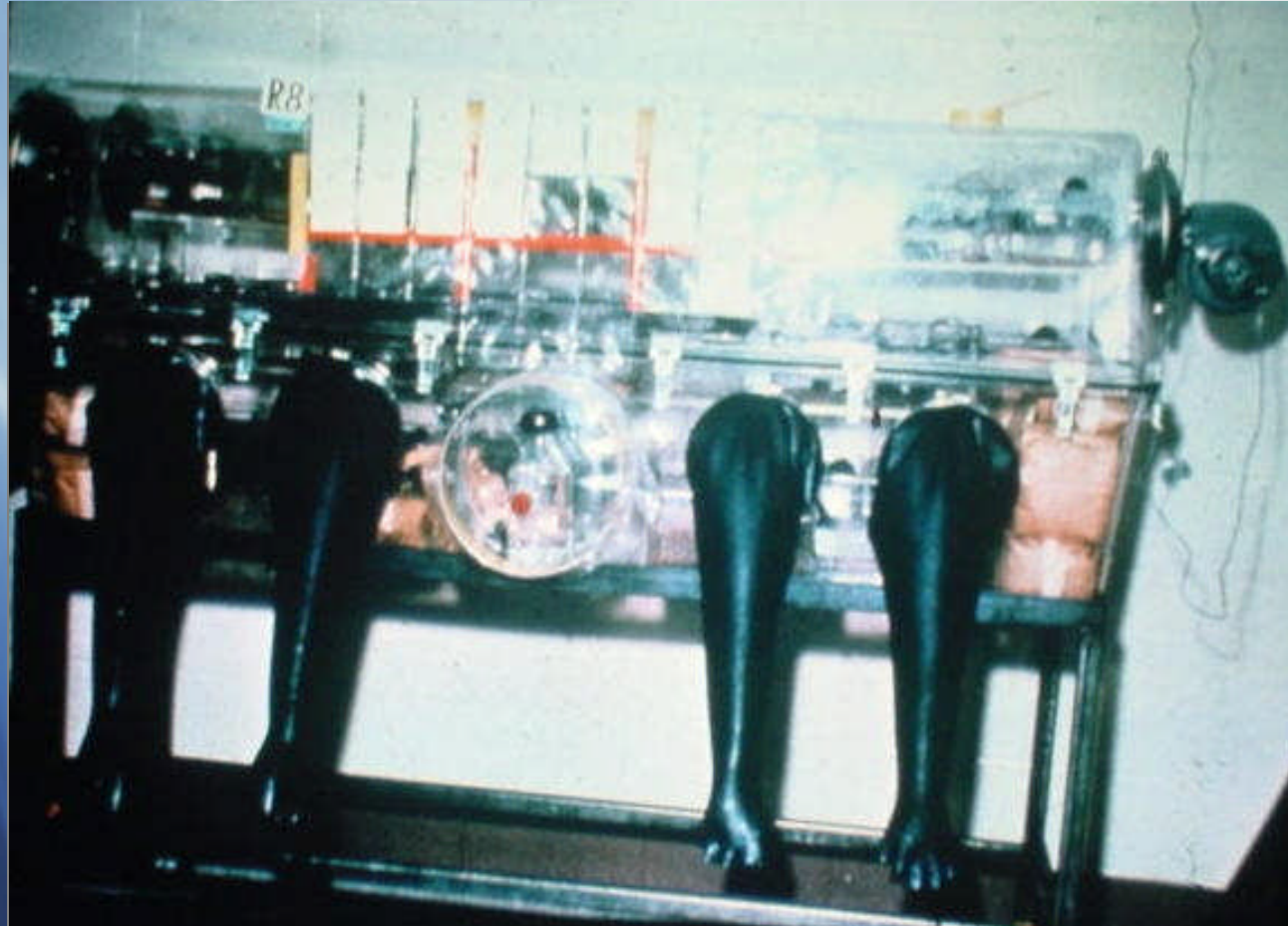
Assembly of shipper



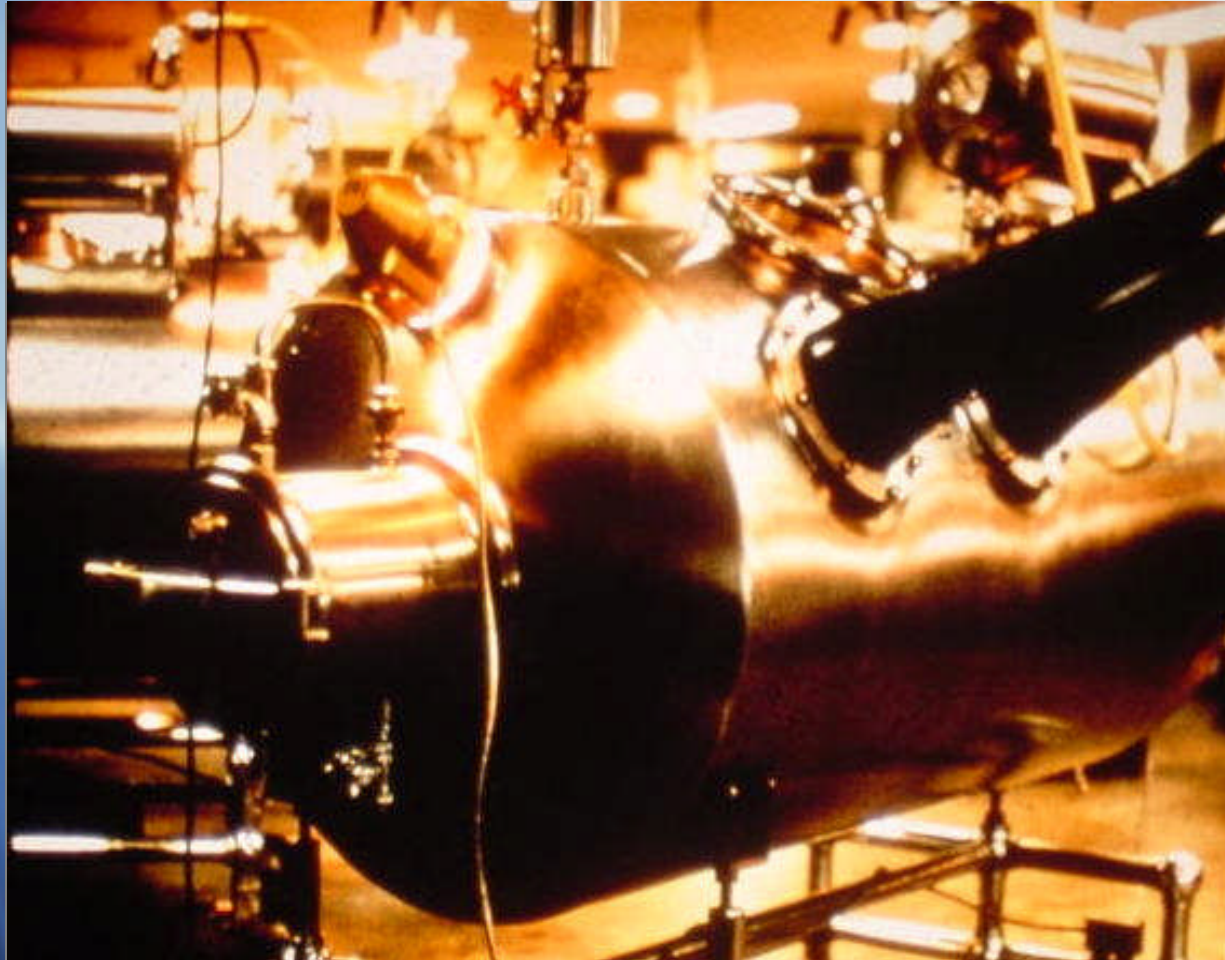
Rigid Isolator Phillip's



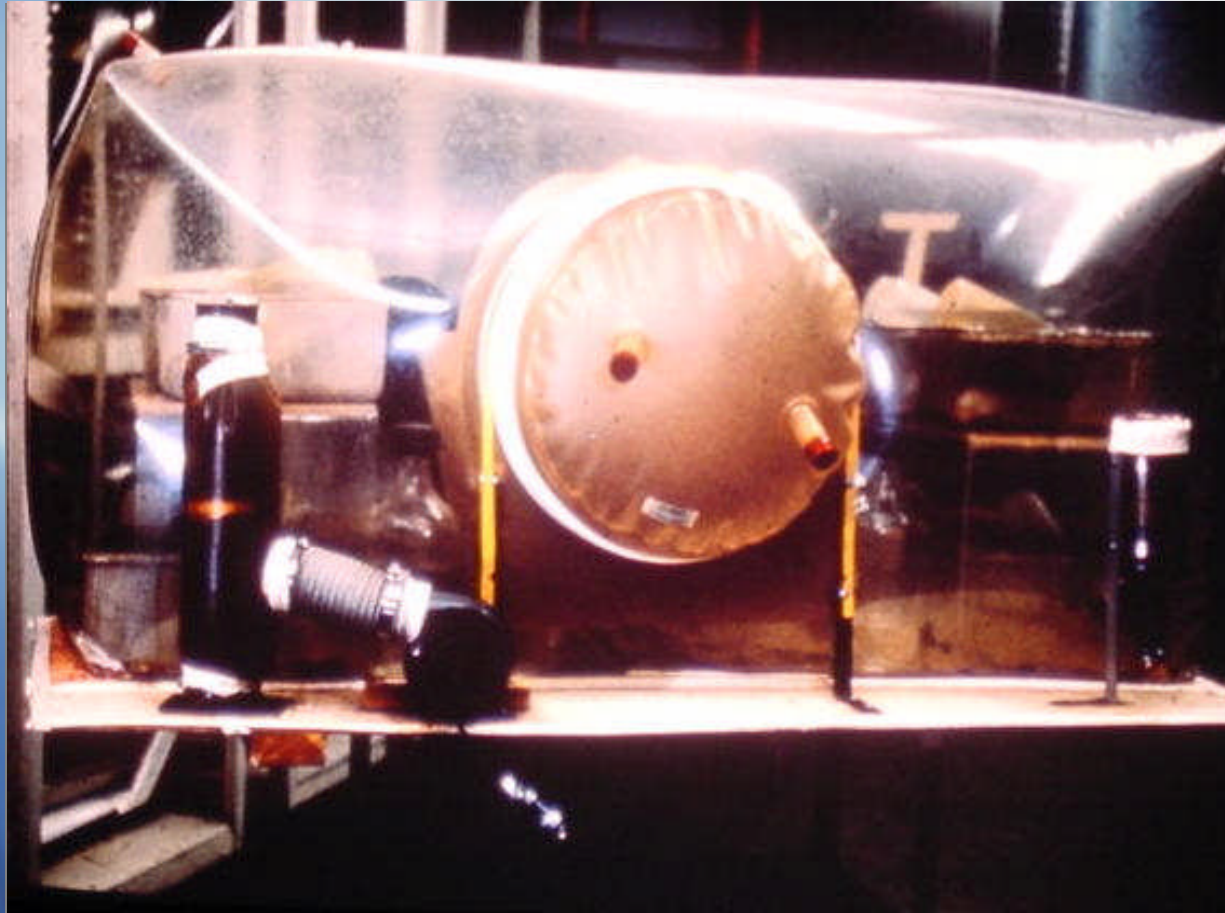
Ridgid Isolator Phillip's



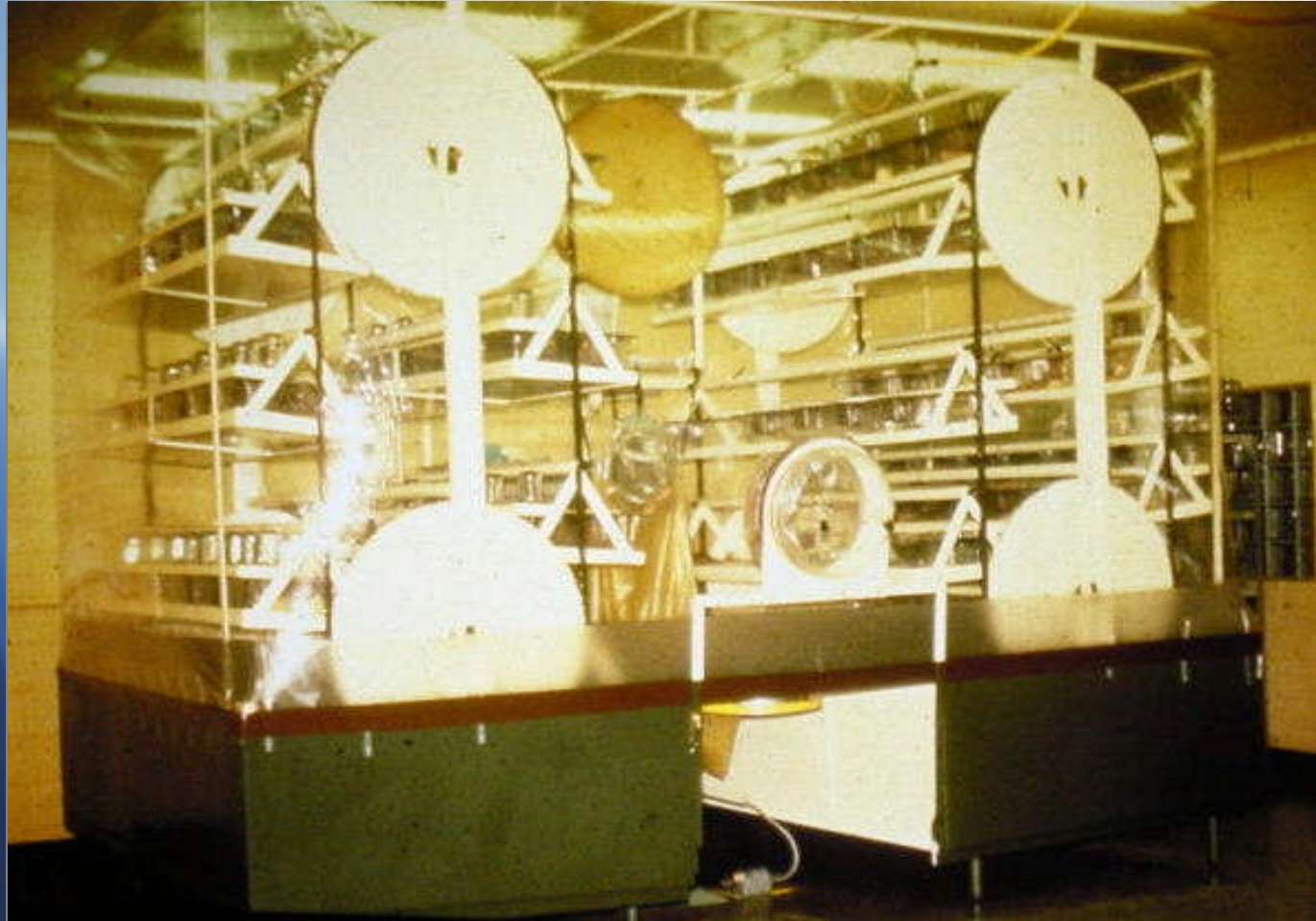
Renier isolator



Trexler isolator flexible film



Ferris Wheel Isolator



Ferris Wheel Isolator operator



Flexible Film Isolator Trexler

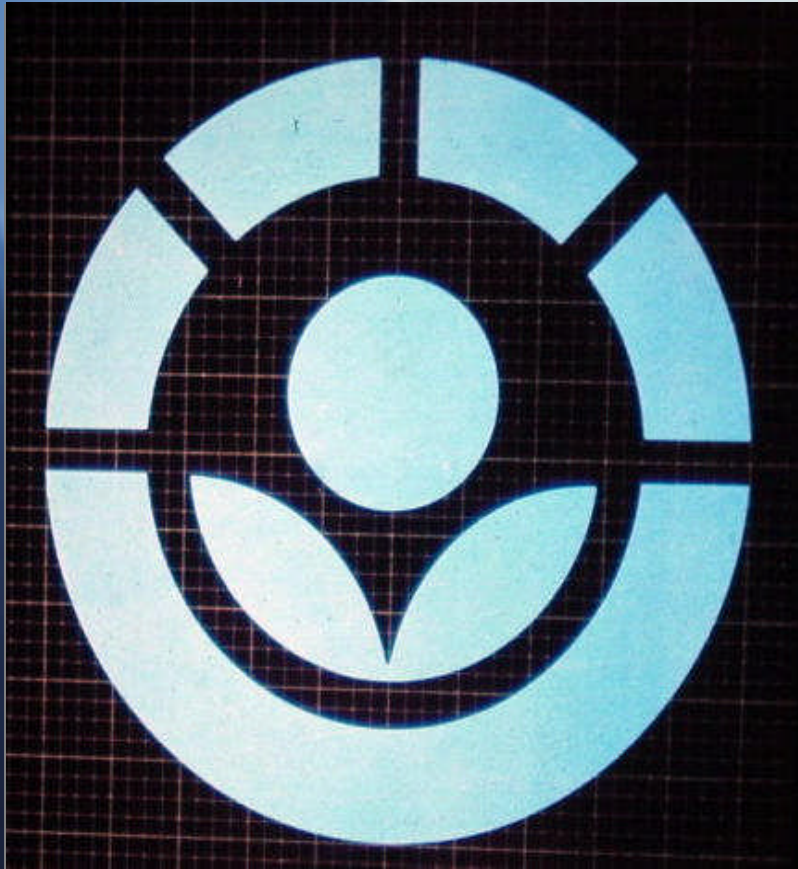


Ethylene oxide sterilizer

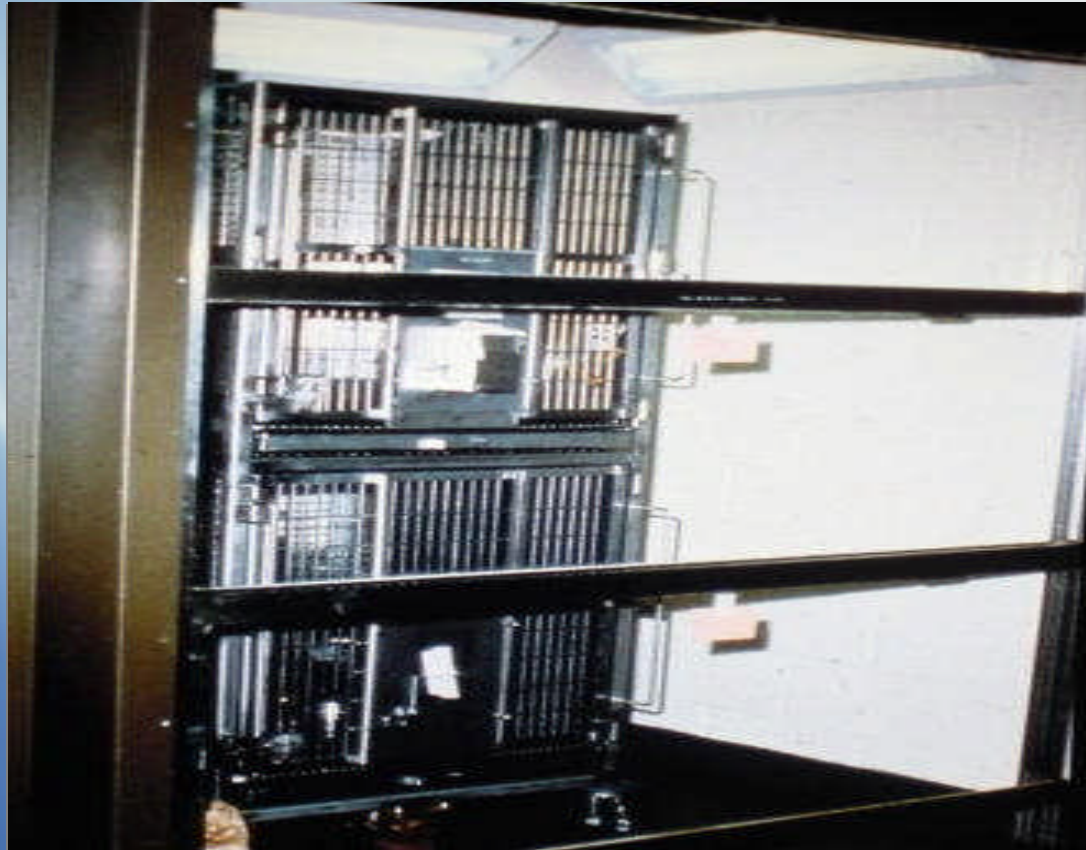


Radura FDA irradiated food symbol

Cobalt 60 gamma irradiation



Illinois cubicle

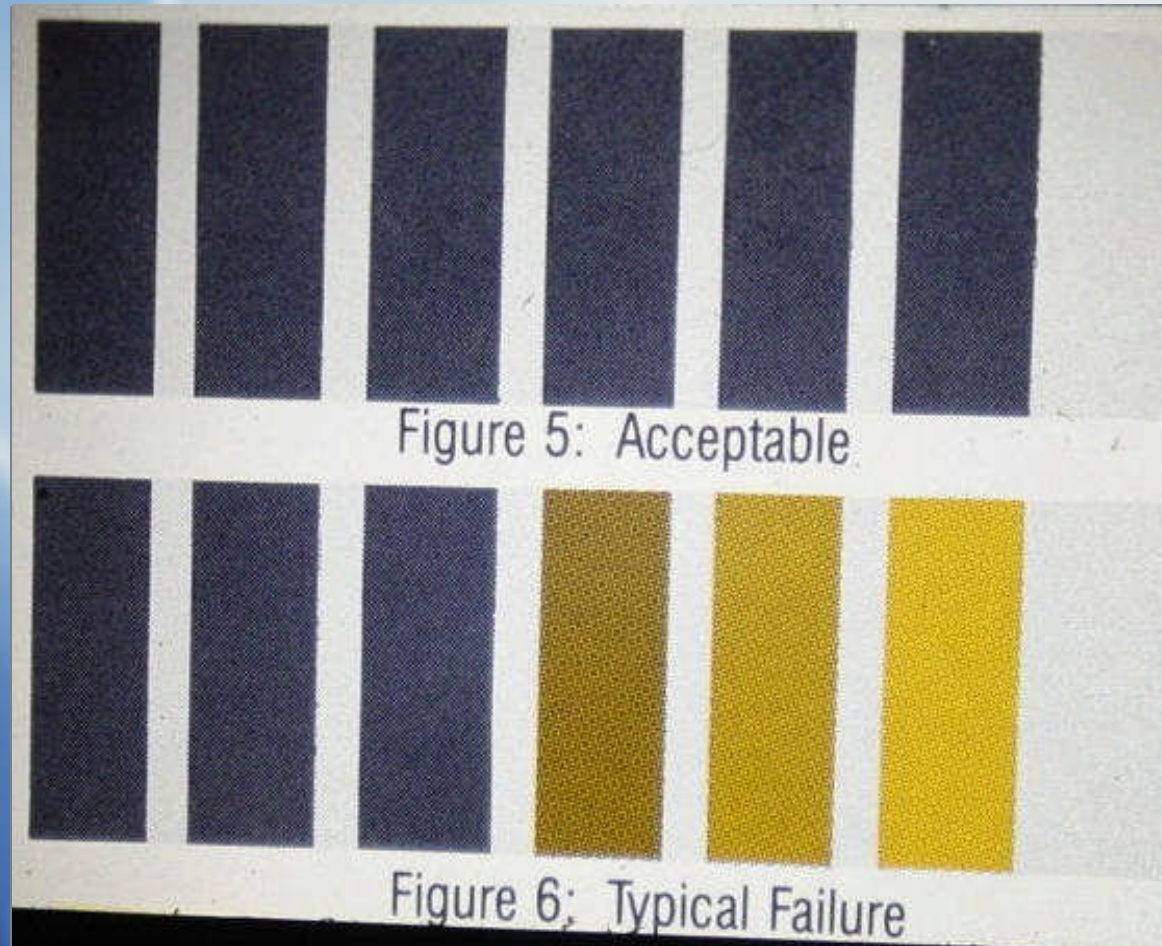


Dart test to check vacuum in autoclave



DART Test

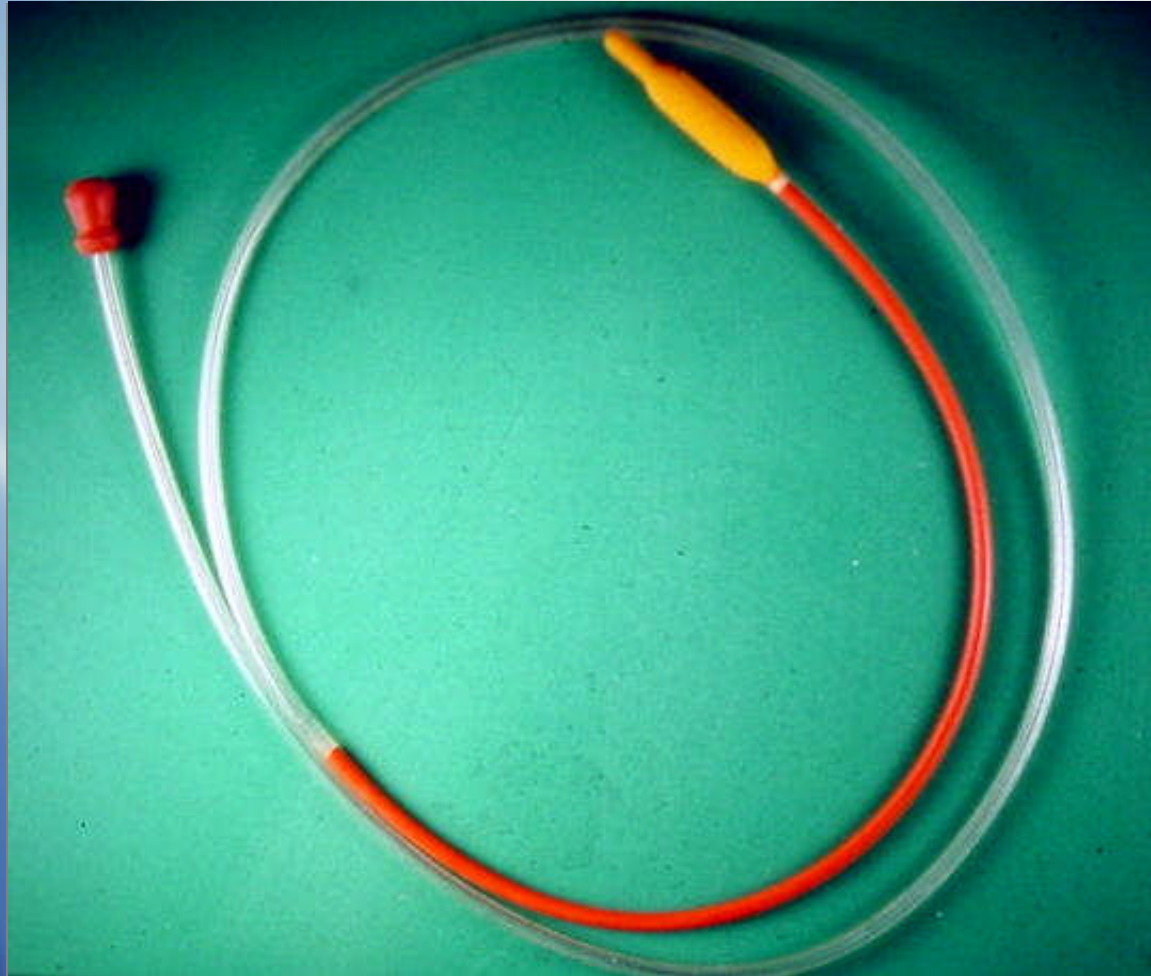
Black is acceptable



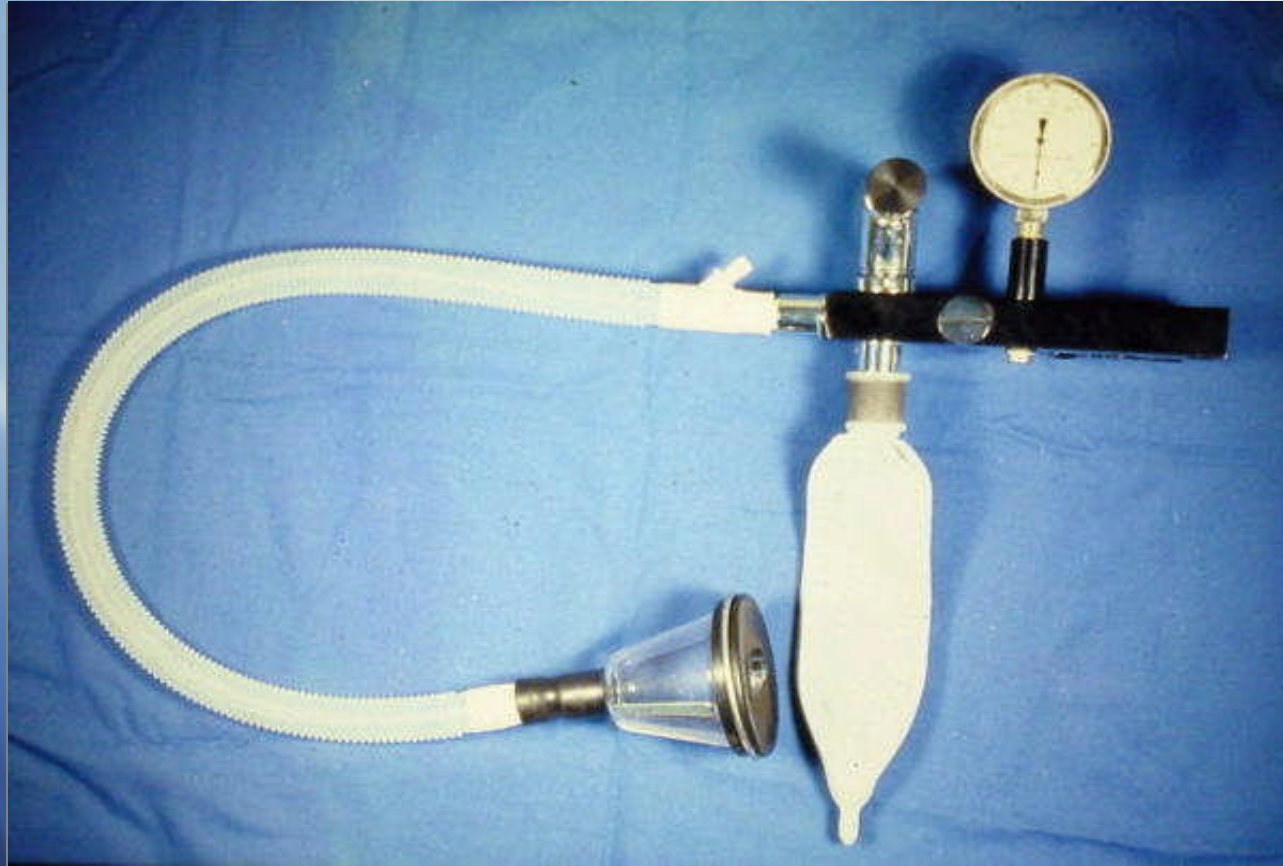
Kirby Bauer Antibiotic sensitivity test



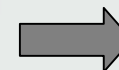
Esophageal Stethoscope



Bain non rebreathing circuit and bag



Transfer squeeze cage for NHP



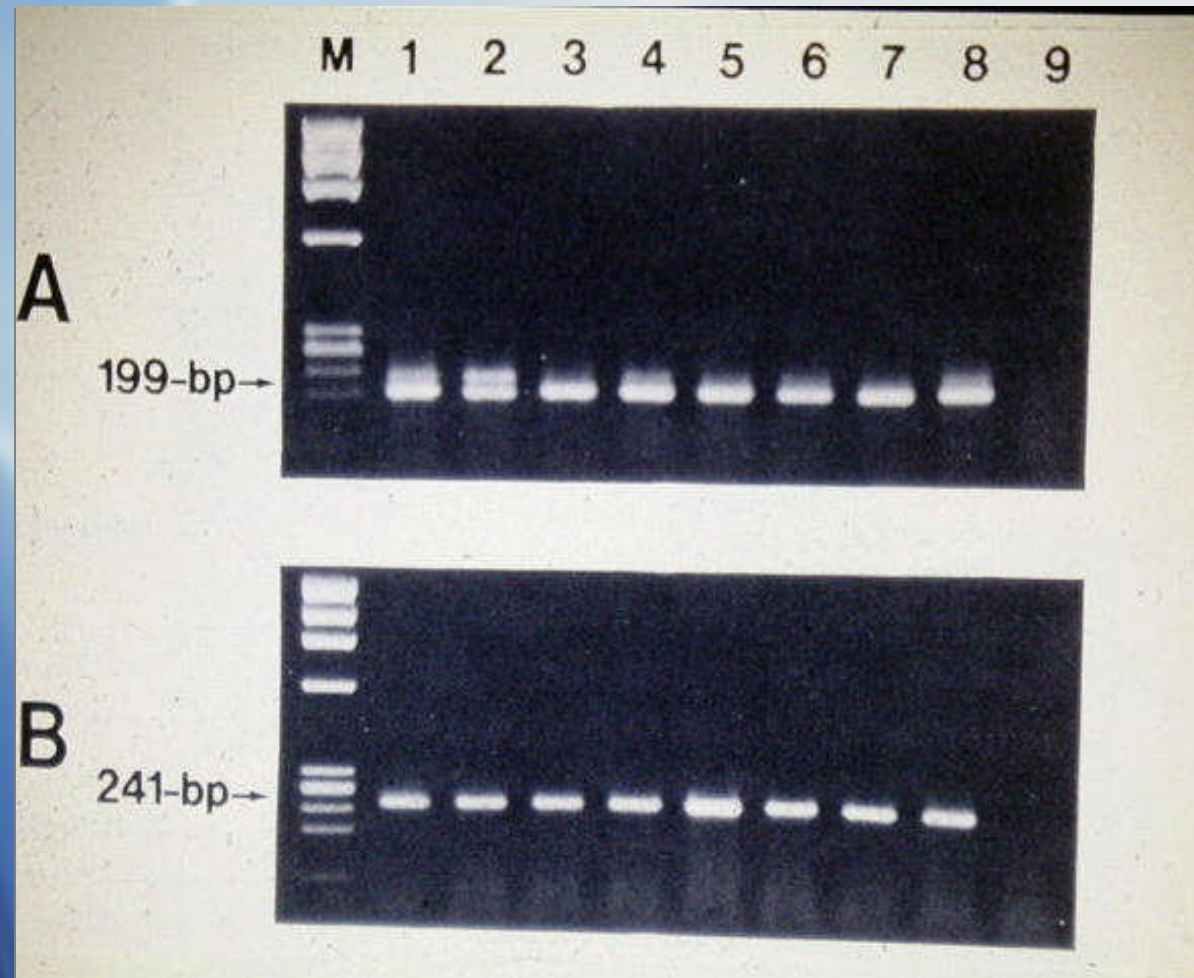
Urinary catheter, stylet, speculum



Primate pole syringe

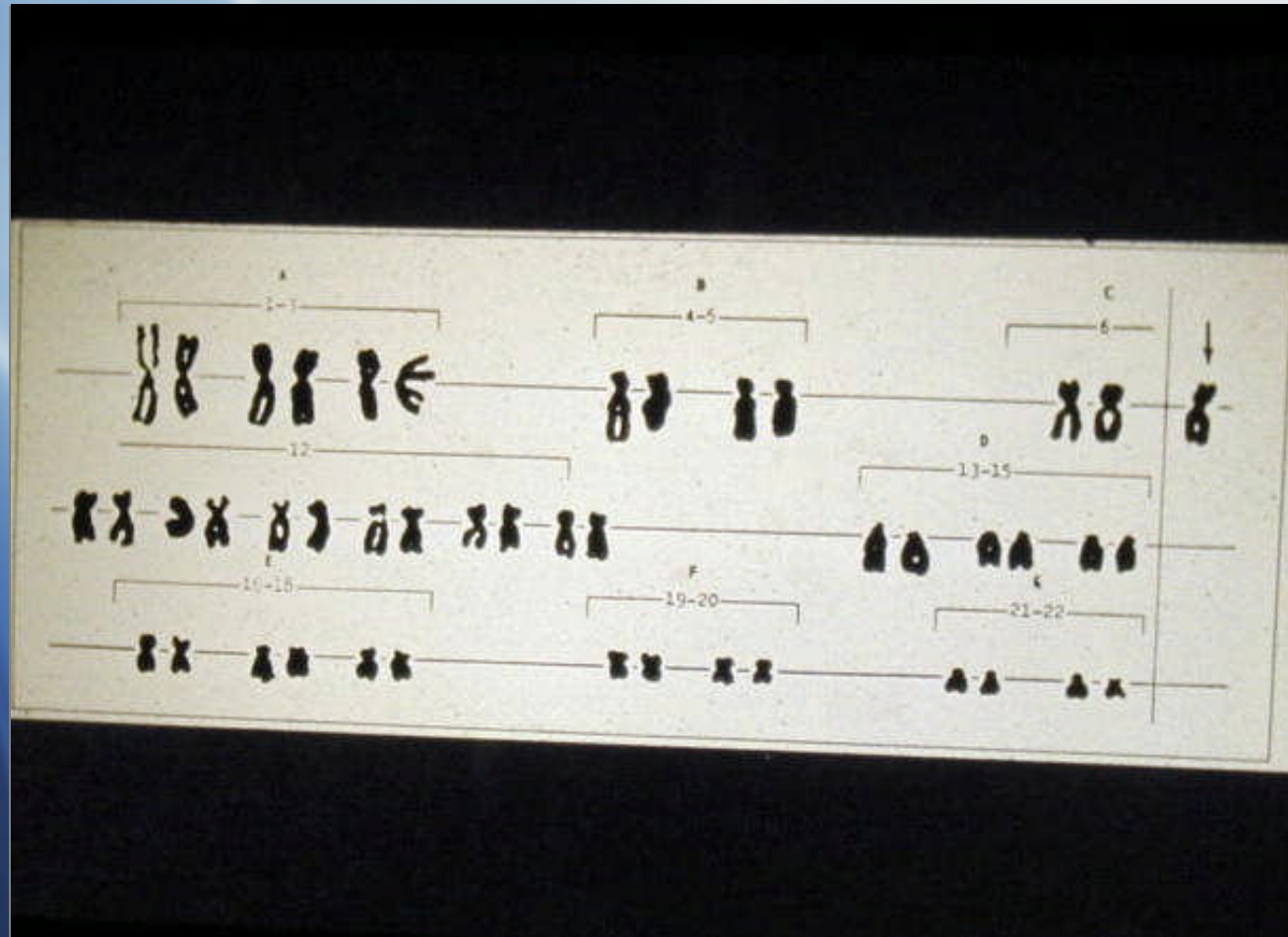


Agarose gel electrophoresis



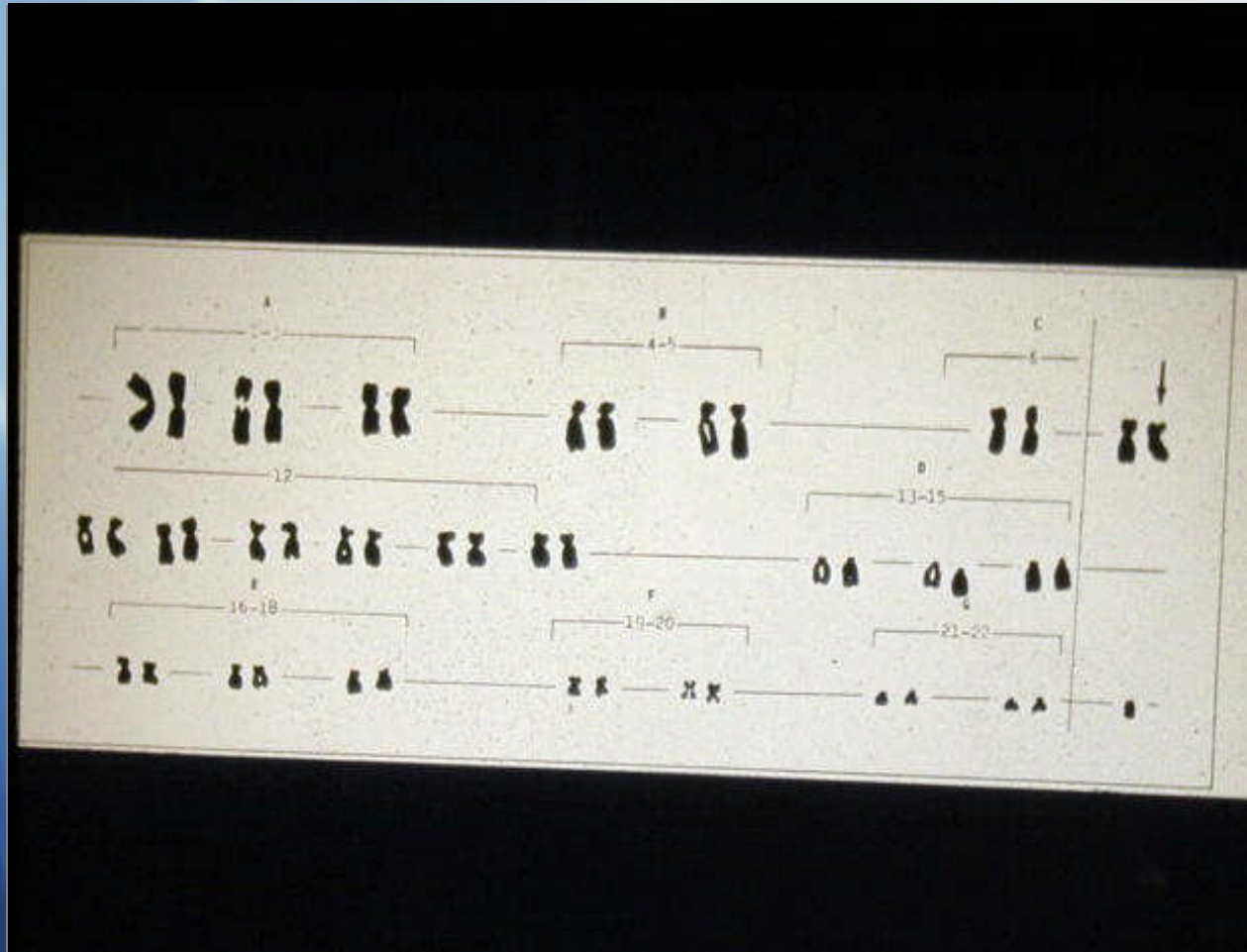
Karyotype

XO = Female with Turner's Syndrome



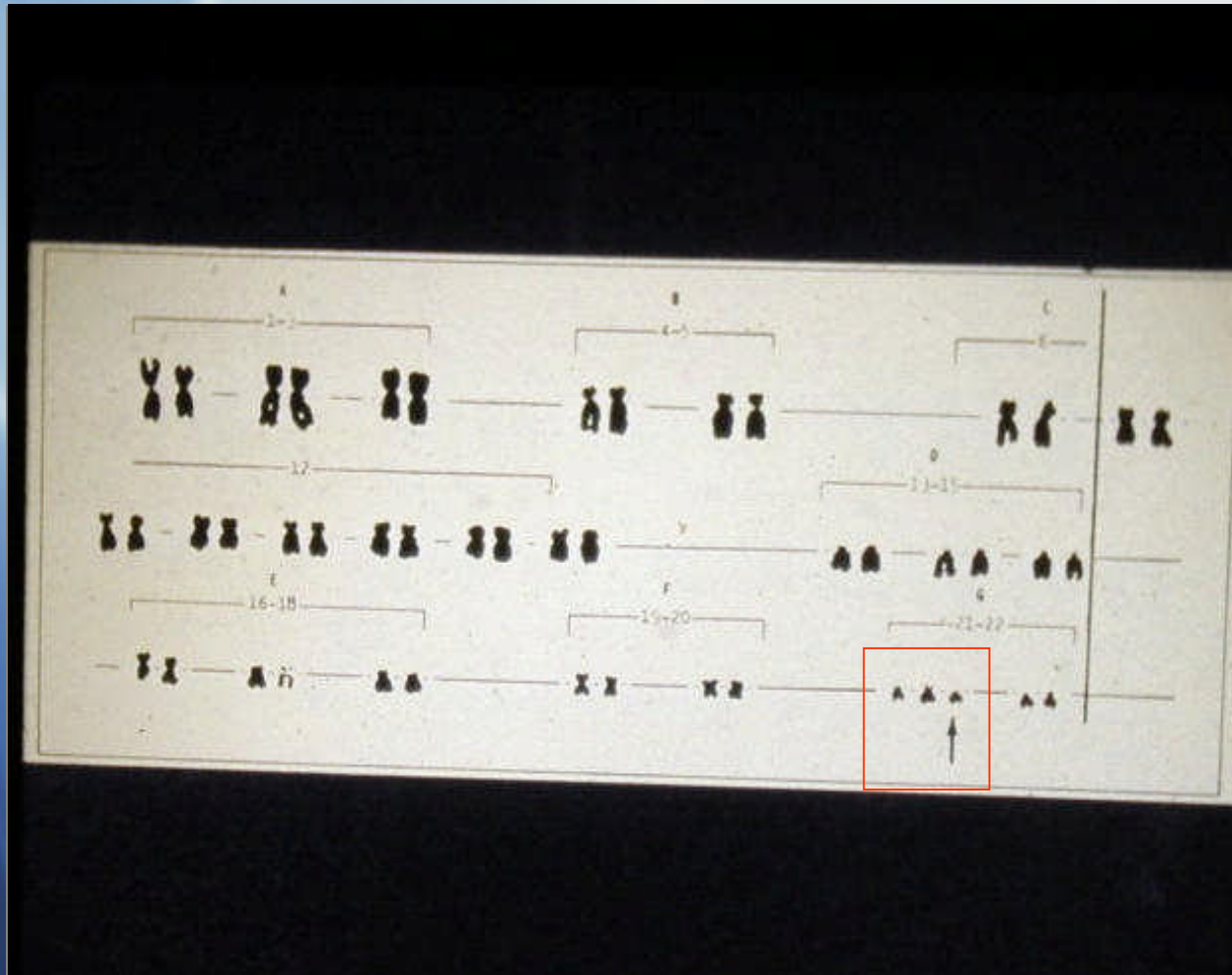
Klinefelter's Syndrome

XXY

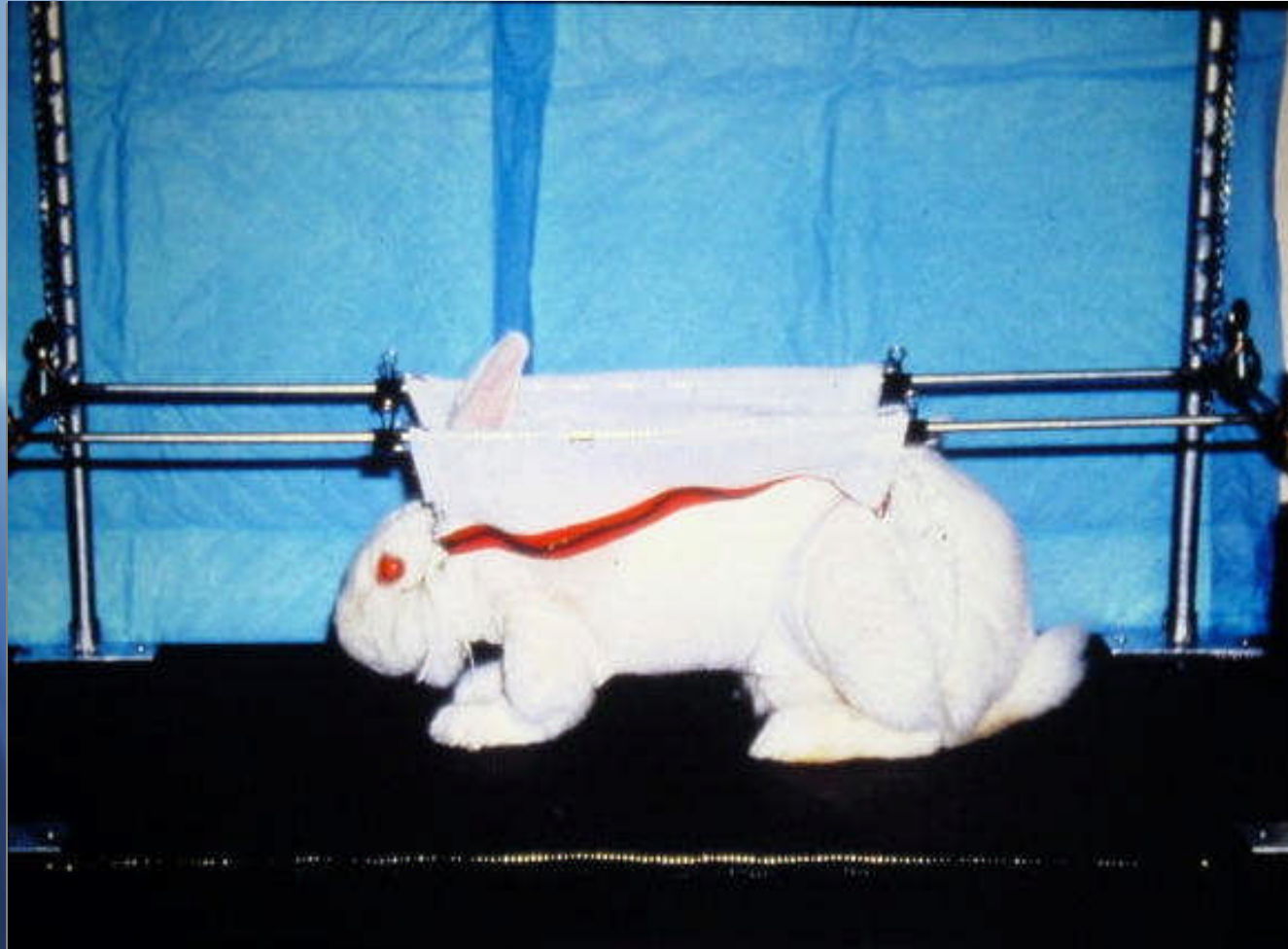


Down's Syndrome

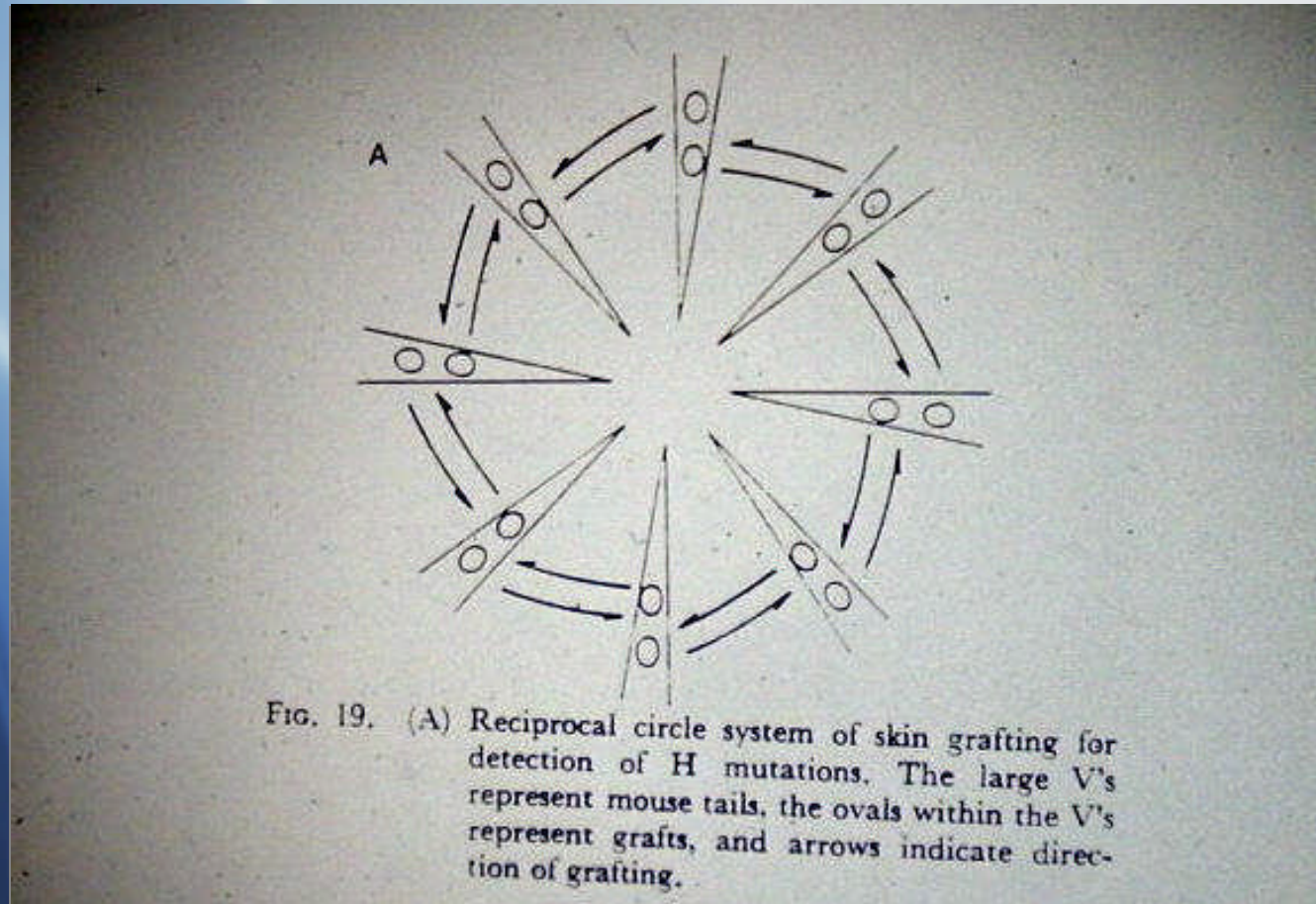
Trisomy 21



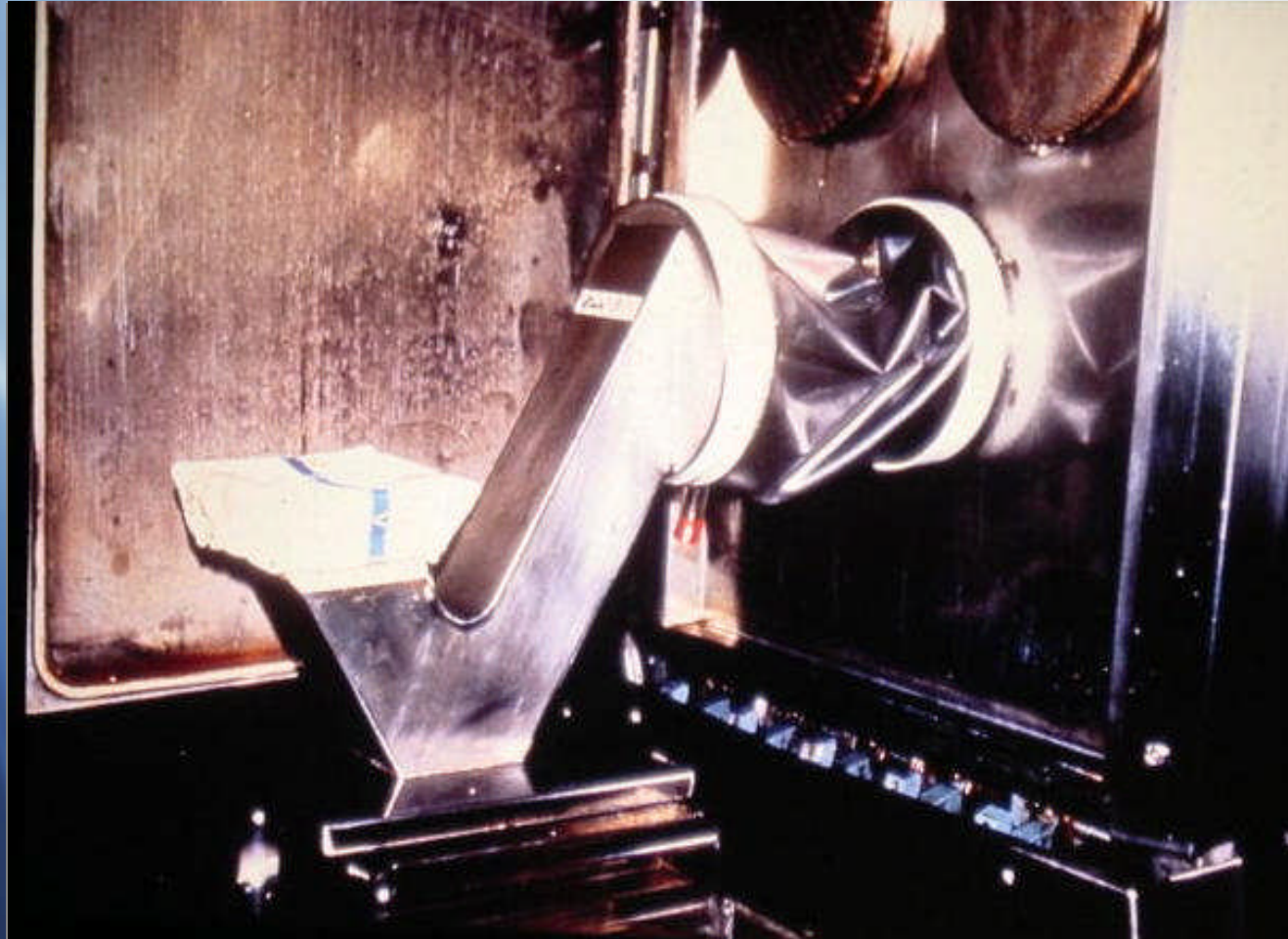
Rabbit sling



Reciprocal circle system of skin grafting



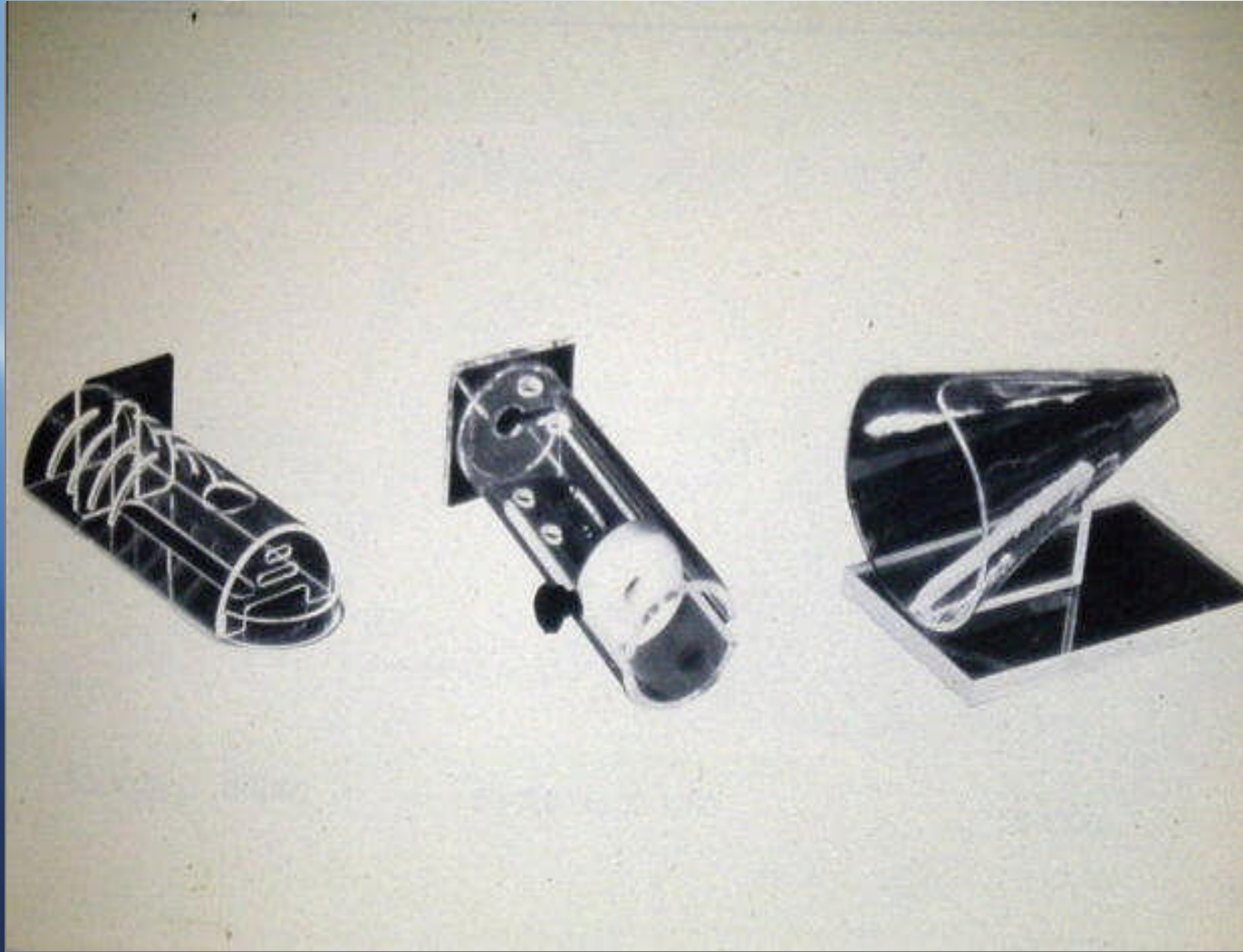
Transport sleeve and dip tank



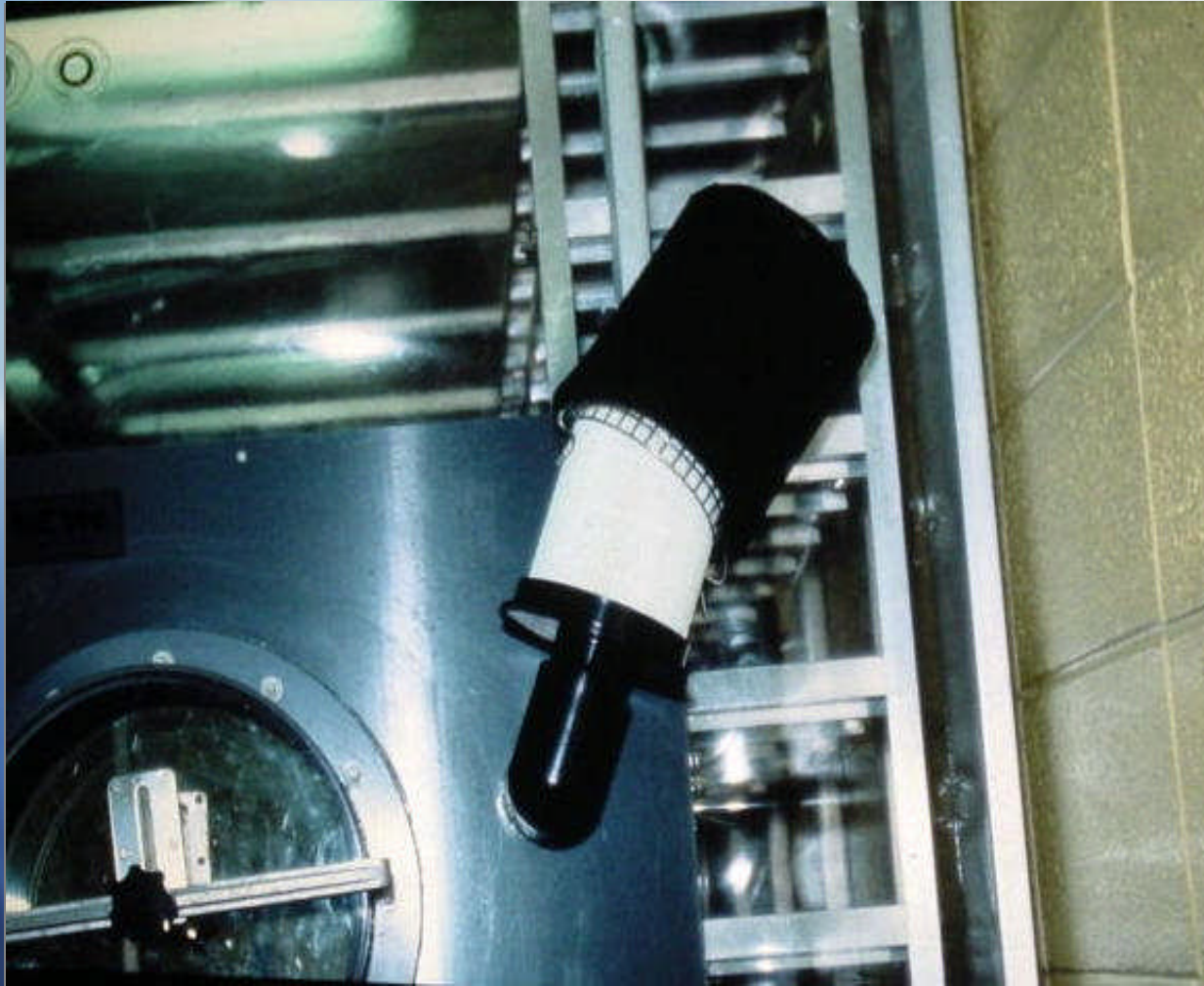
Feed before and after autoclave4



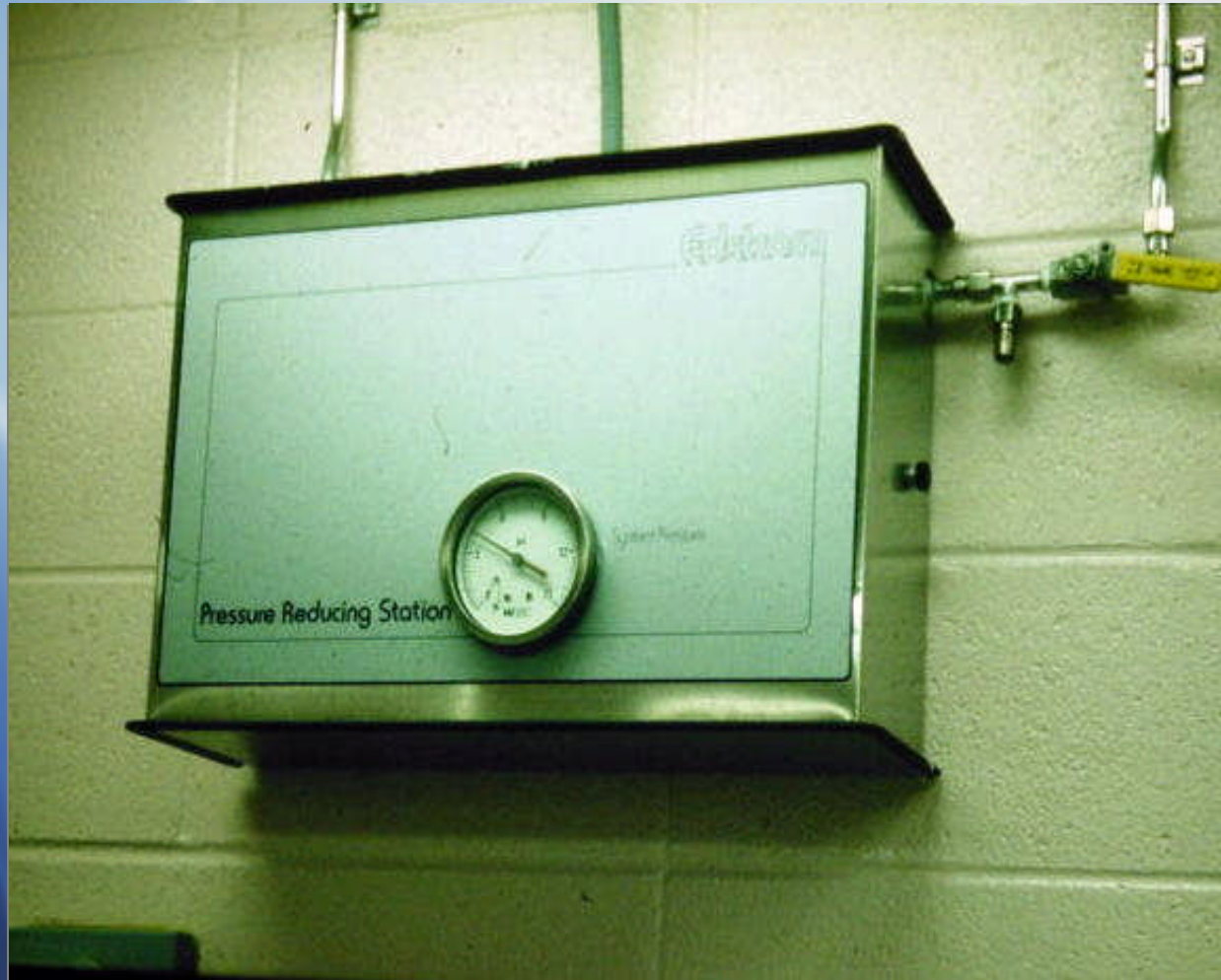
Rodent restrainers and injection cone



HEPA Filter on Isolator

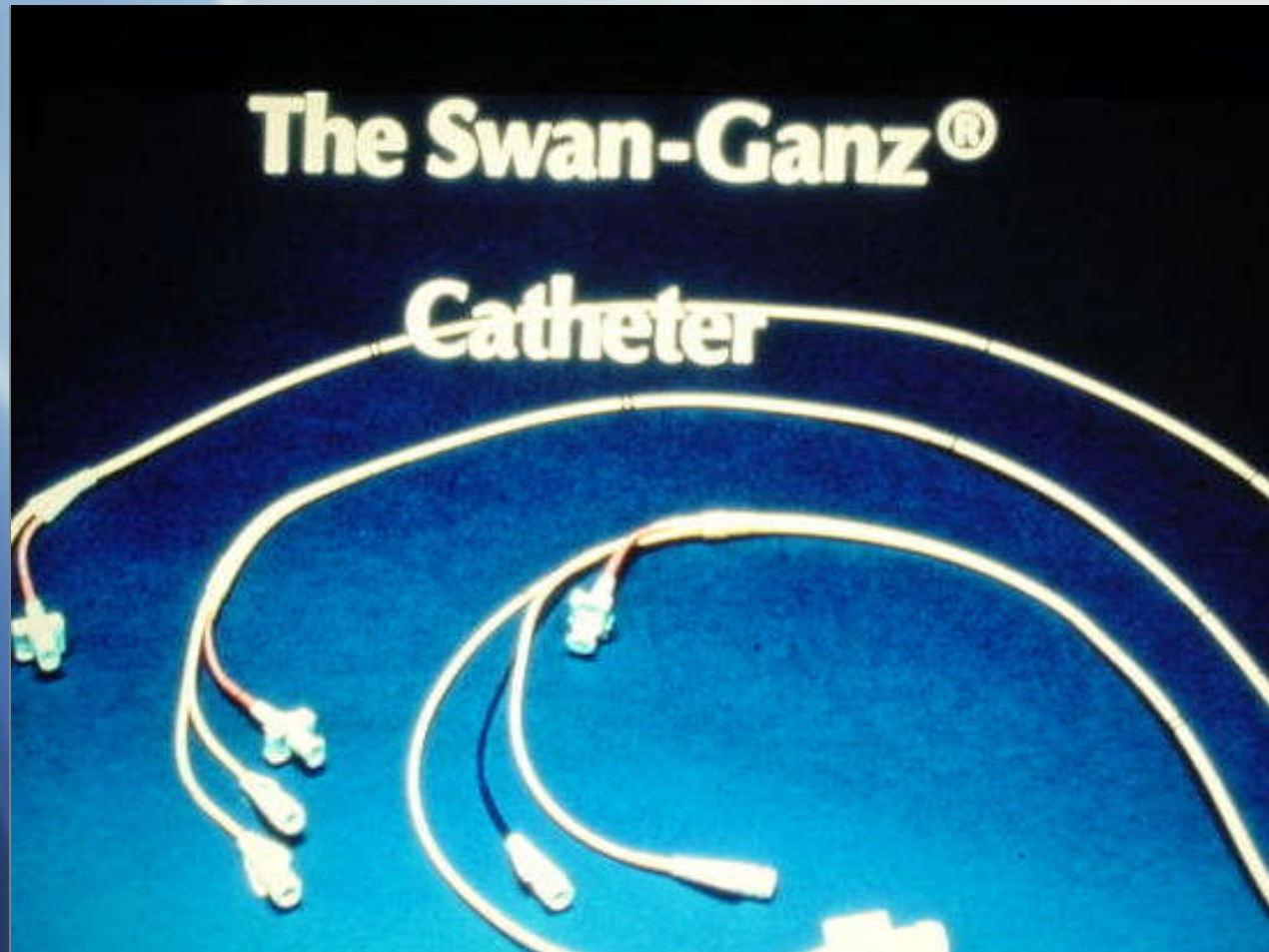


Pressure Reducing Station

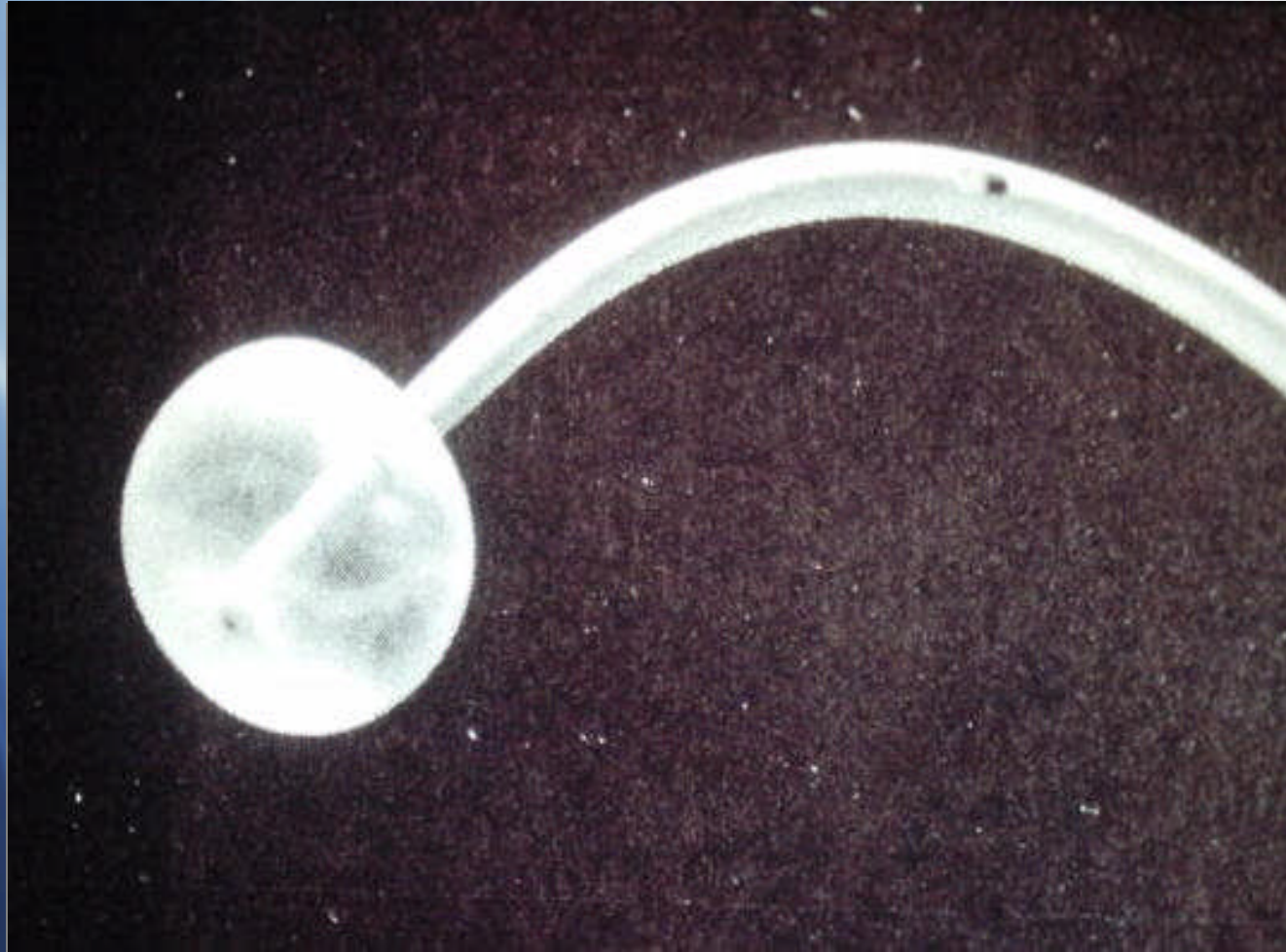


Thermo Dilution Catheter

Pulmonary capillary wedge pressure

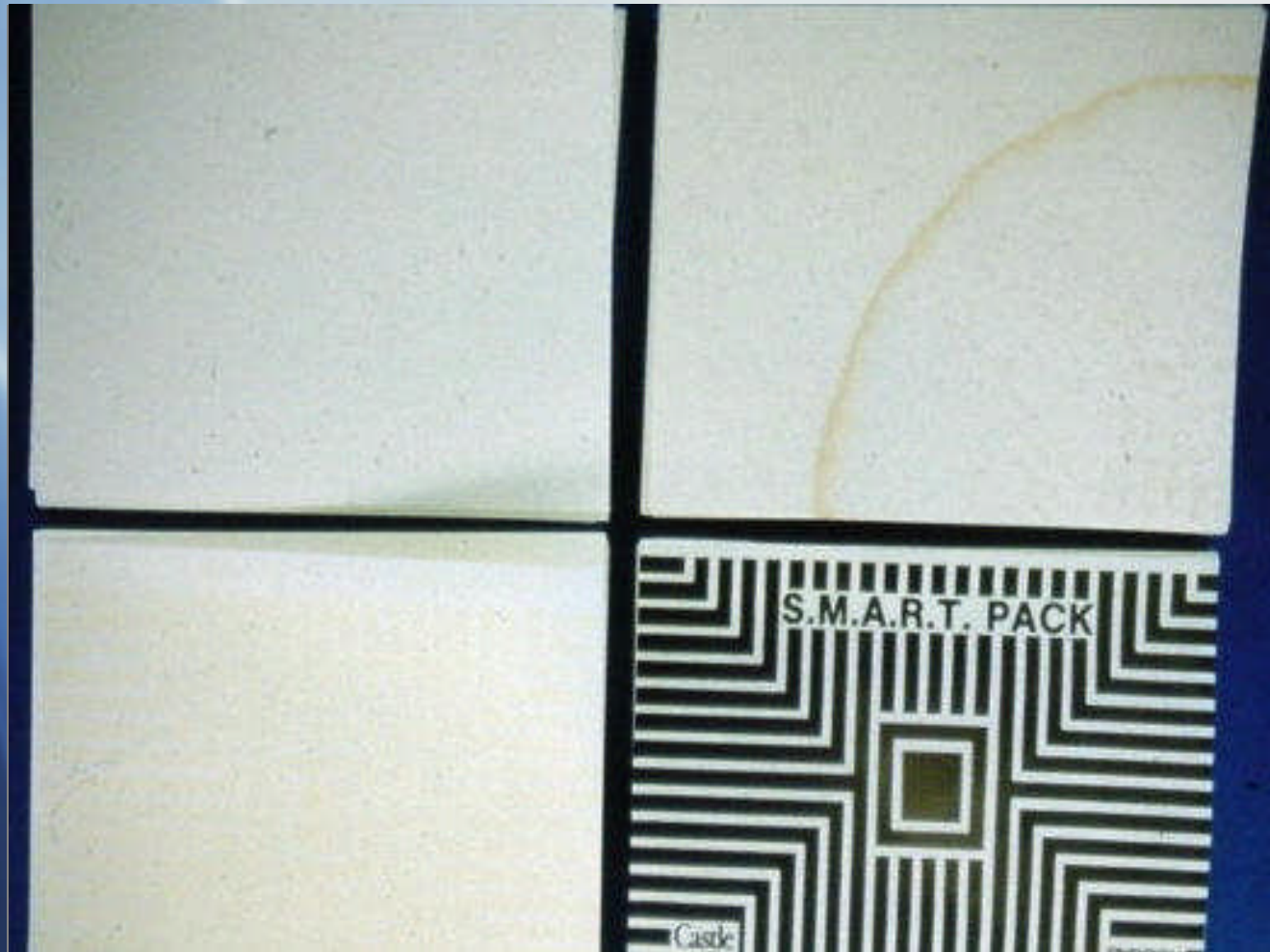


Swan-Ganz catheter tip



Bowie-Dick

Checks vacuum in autoclave



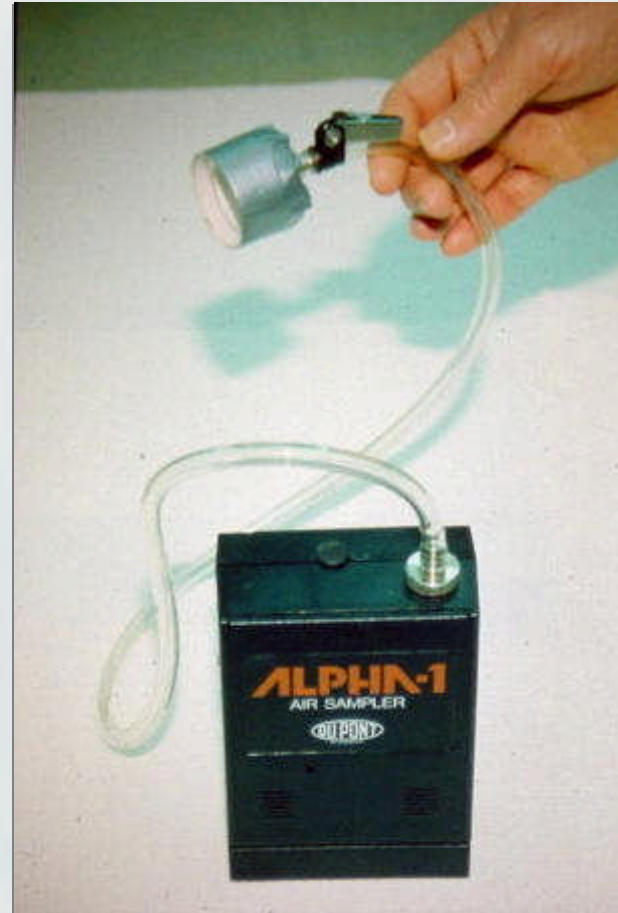
F/air scavenge system, vaporizer, bead sterilizer, flow meter



HEPA Filtered vacuum cleaner



Air Sampler measures particles



Light meter



Acid wash rabbit caging



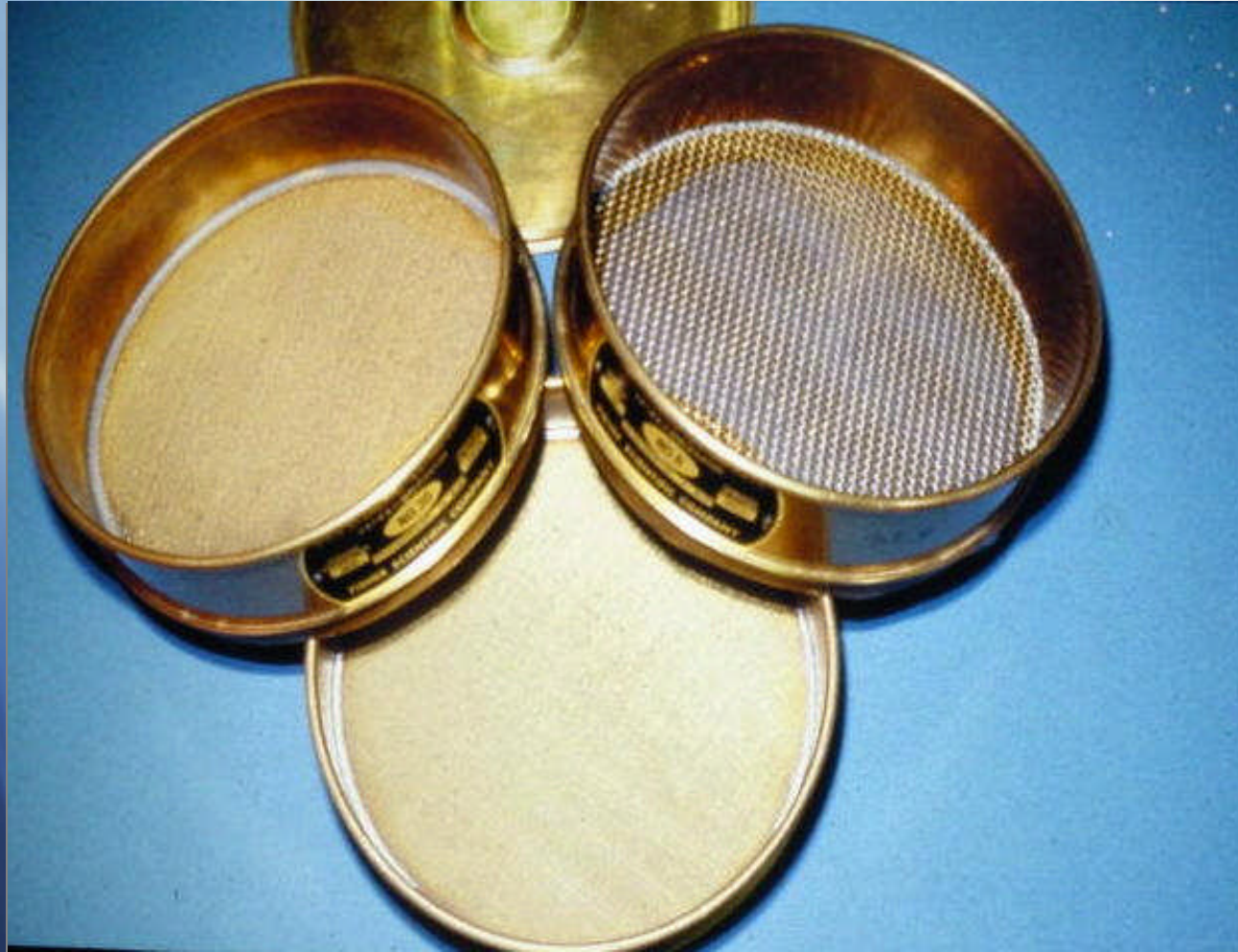
Fit Test for Respirator



Sieves for measuring bedding particle size



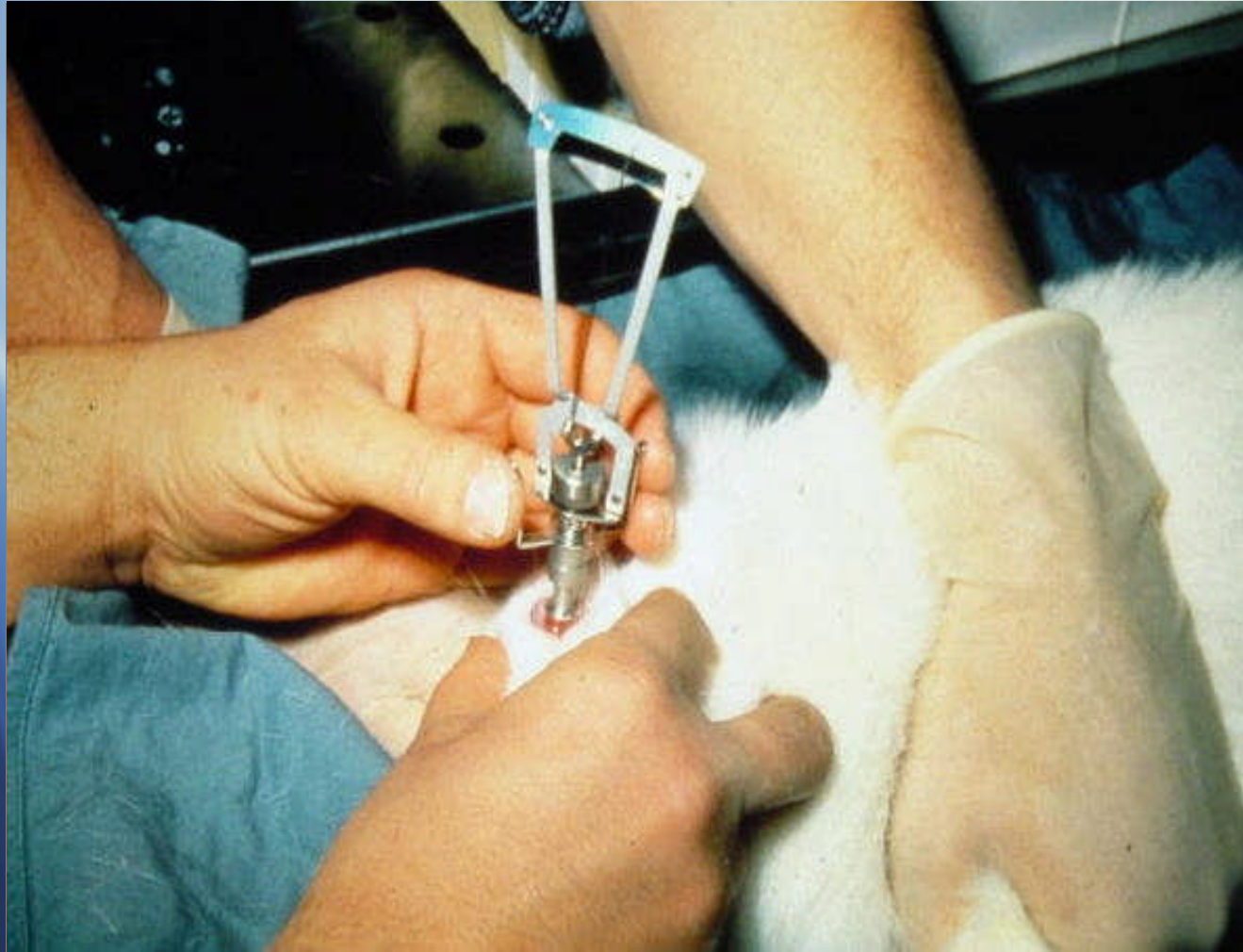
Sieves close up



Hearing protection



Tonometer IOP measurements



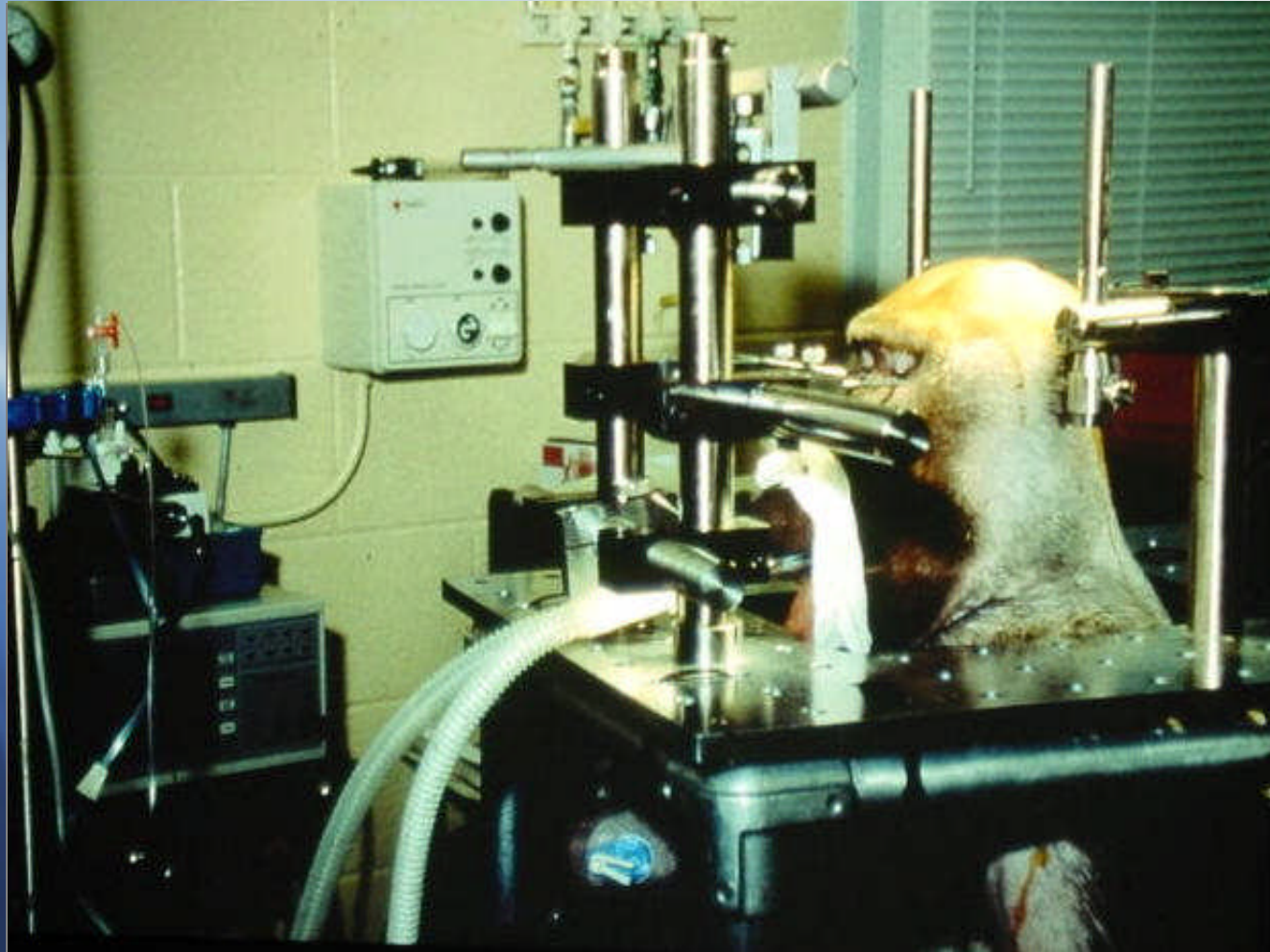
Pests on sticky board



Primate stereotaxic chair

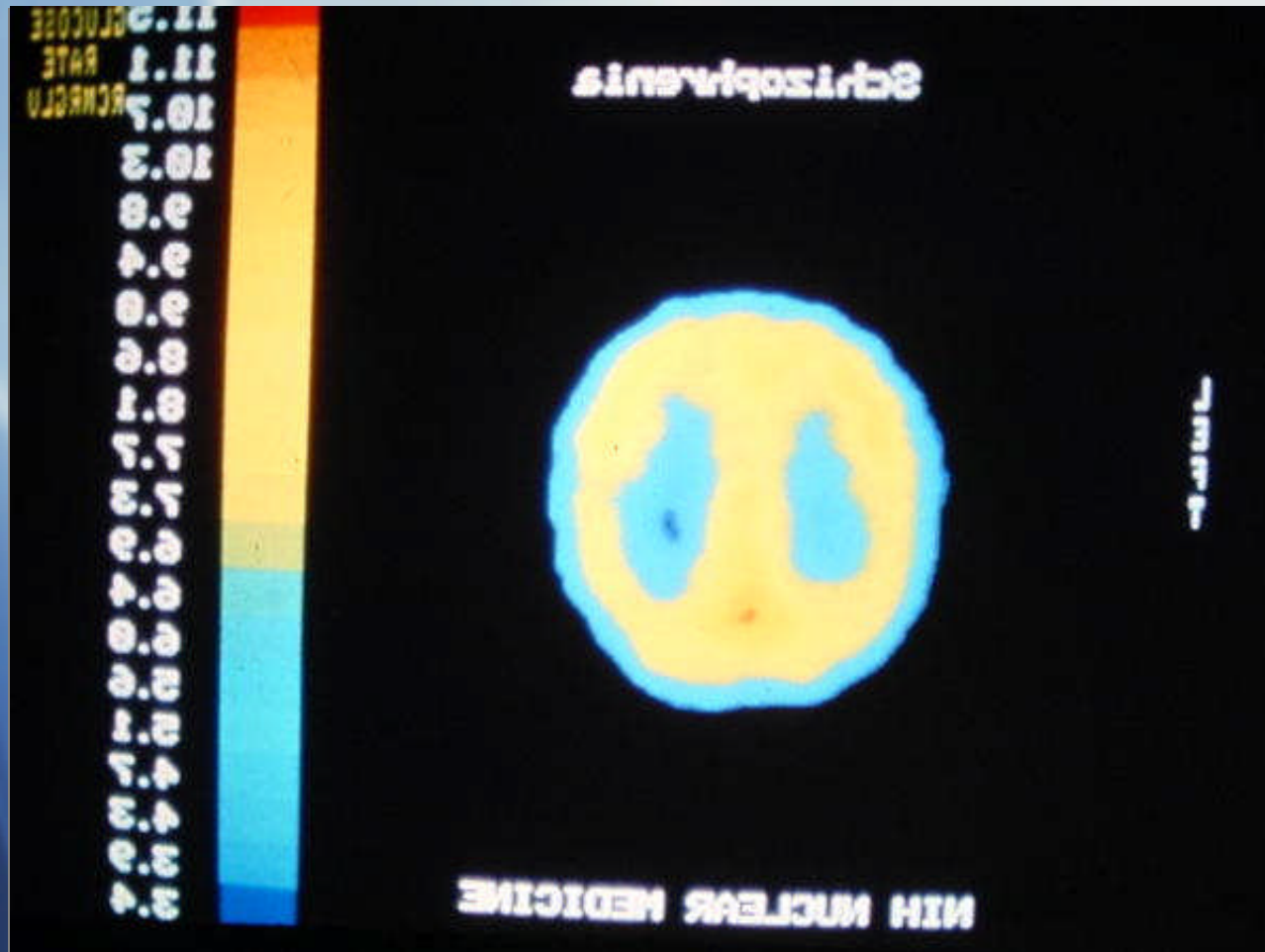


Stereotaxic chair with baboon

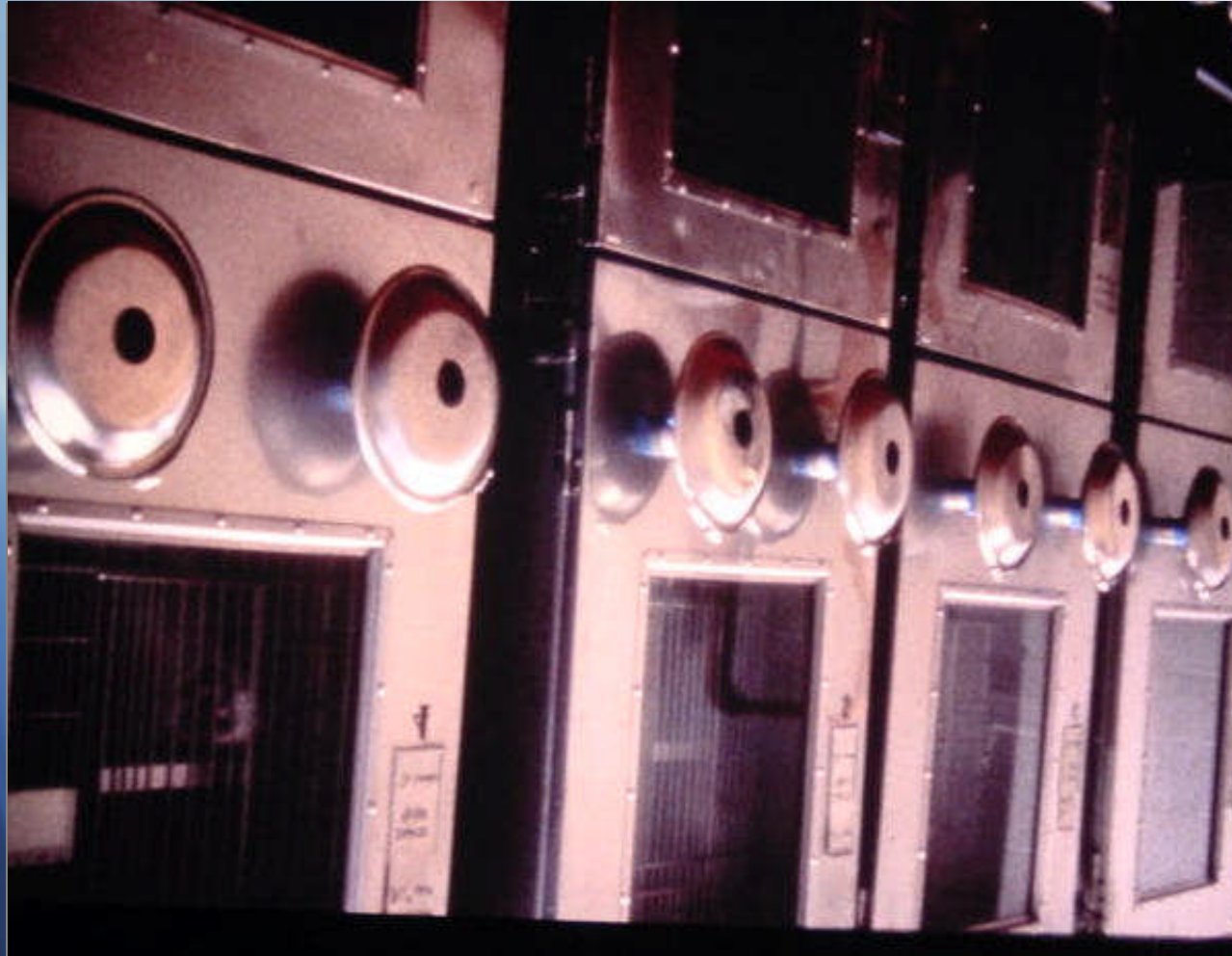


PET scan

Positron Emission Tomography



Horsfall chambers



Horsfall chambers old



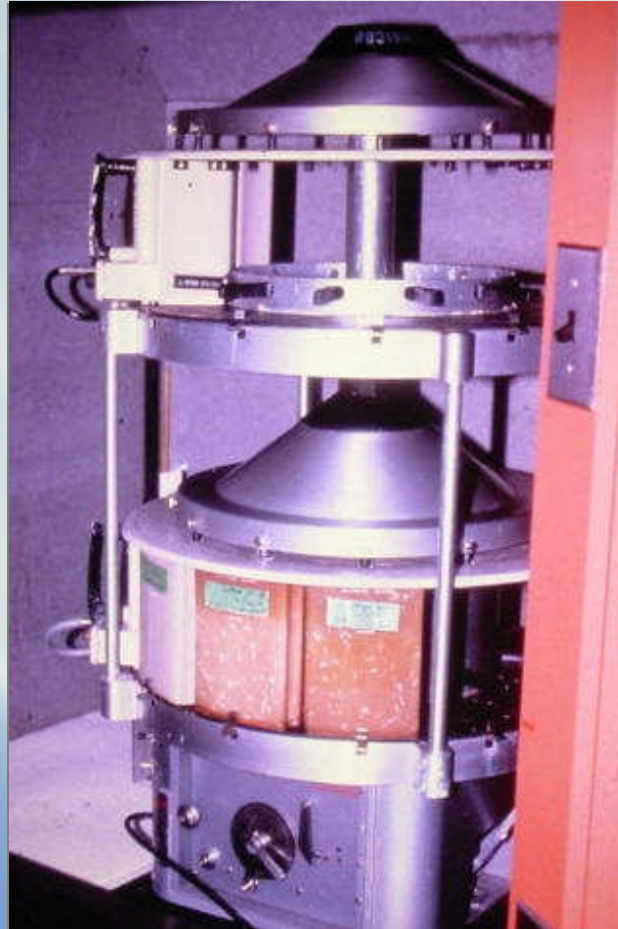
Rack manifold



Bedding dumping station



Tissue processor



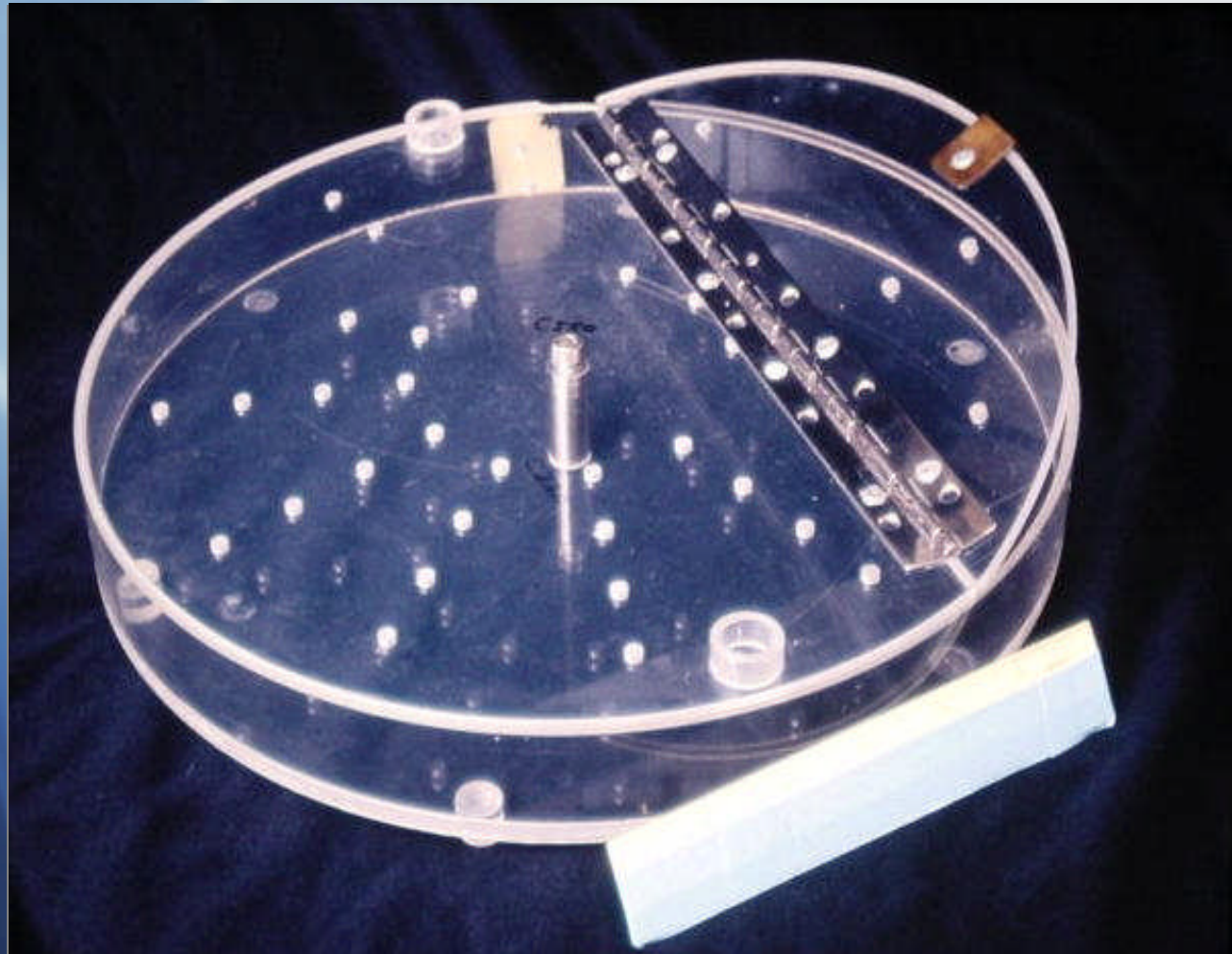
Down draft necropsy table



Spayed female tattoo AVMA designation



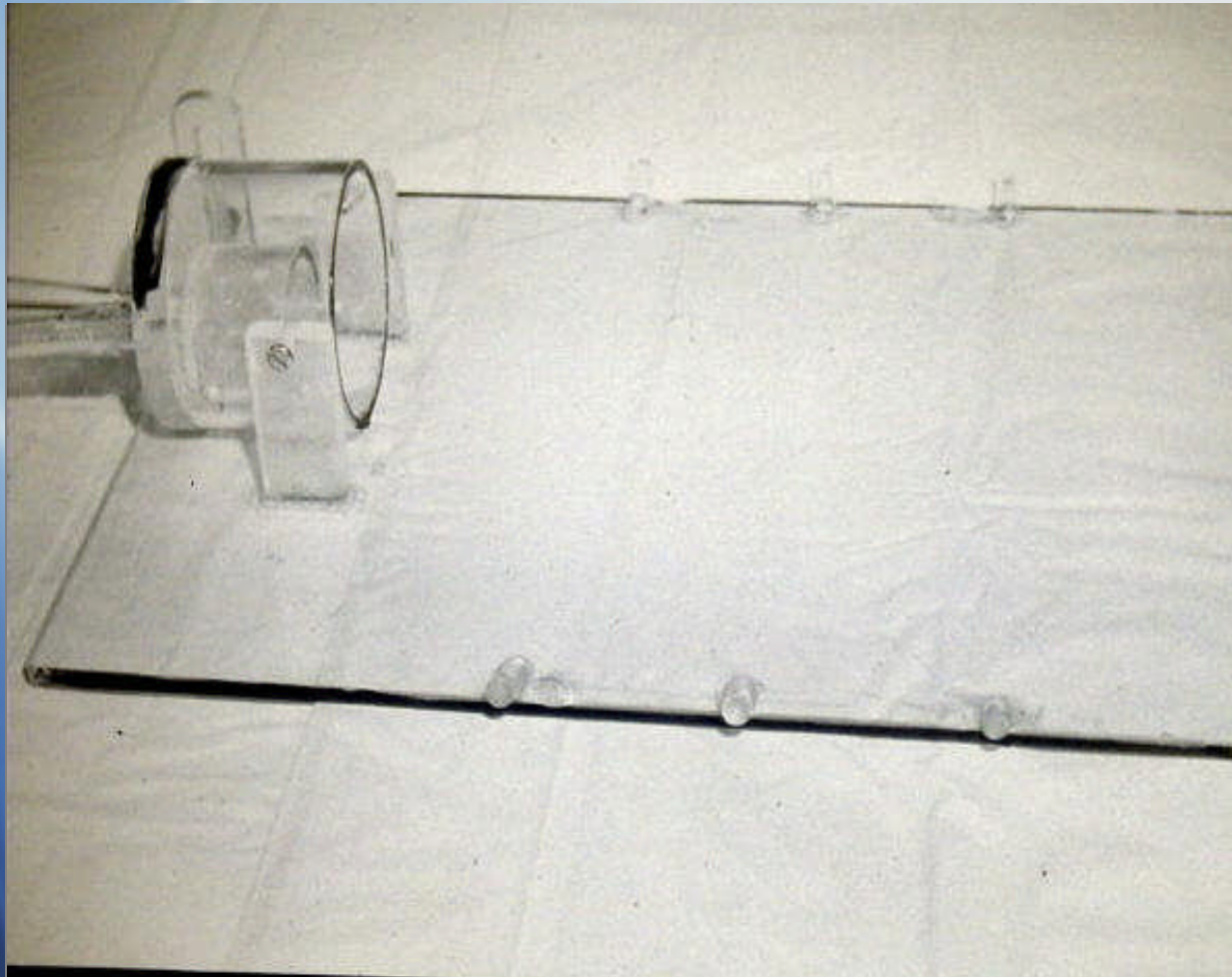
Rodent restrainer for irradiation



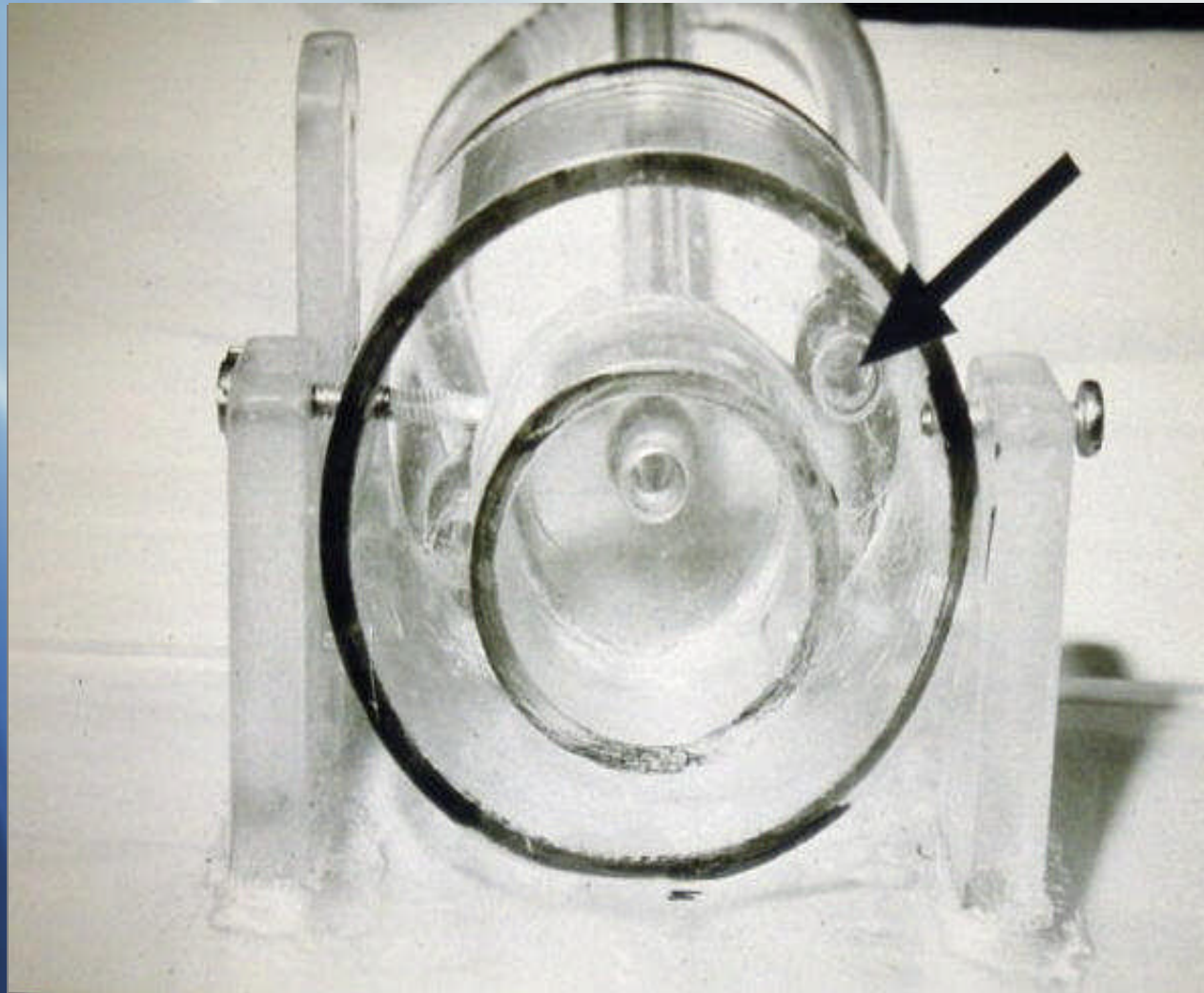
Humane rodent traps



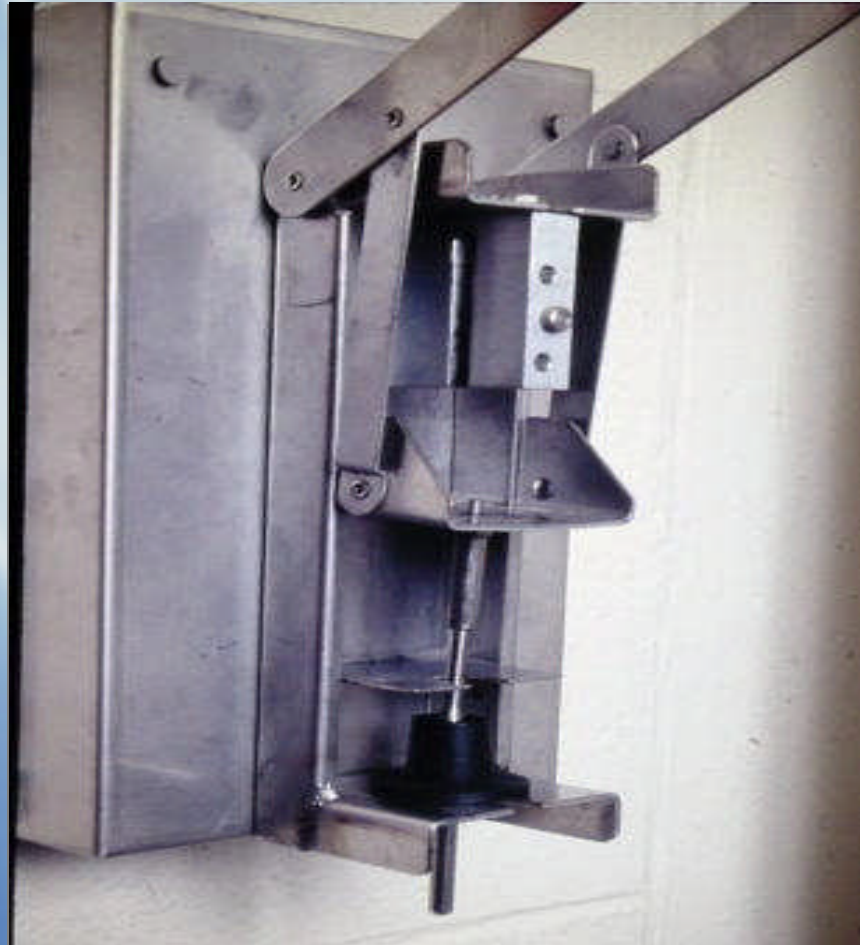
Rodent anesthesia platform



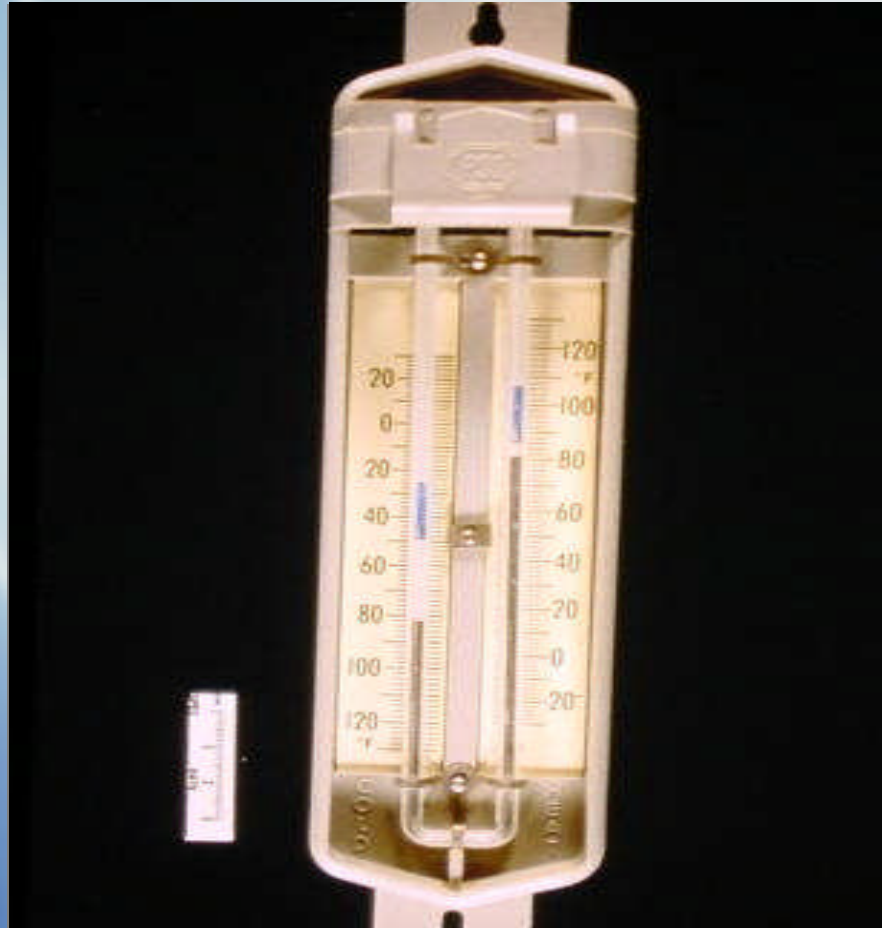
Rodent anesthesia platform with scavenge



Sipper tube insert/removal device



Min/max thermometer



Pulse oximeter cuffs



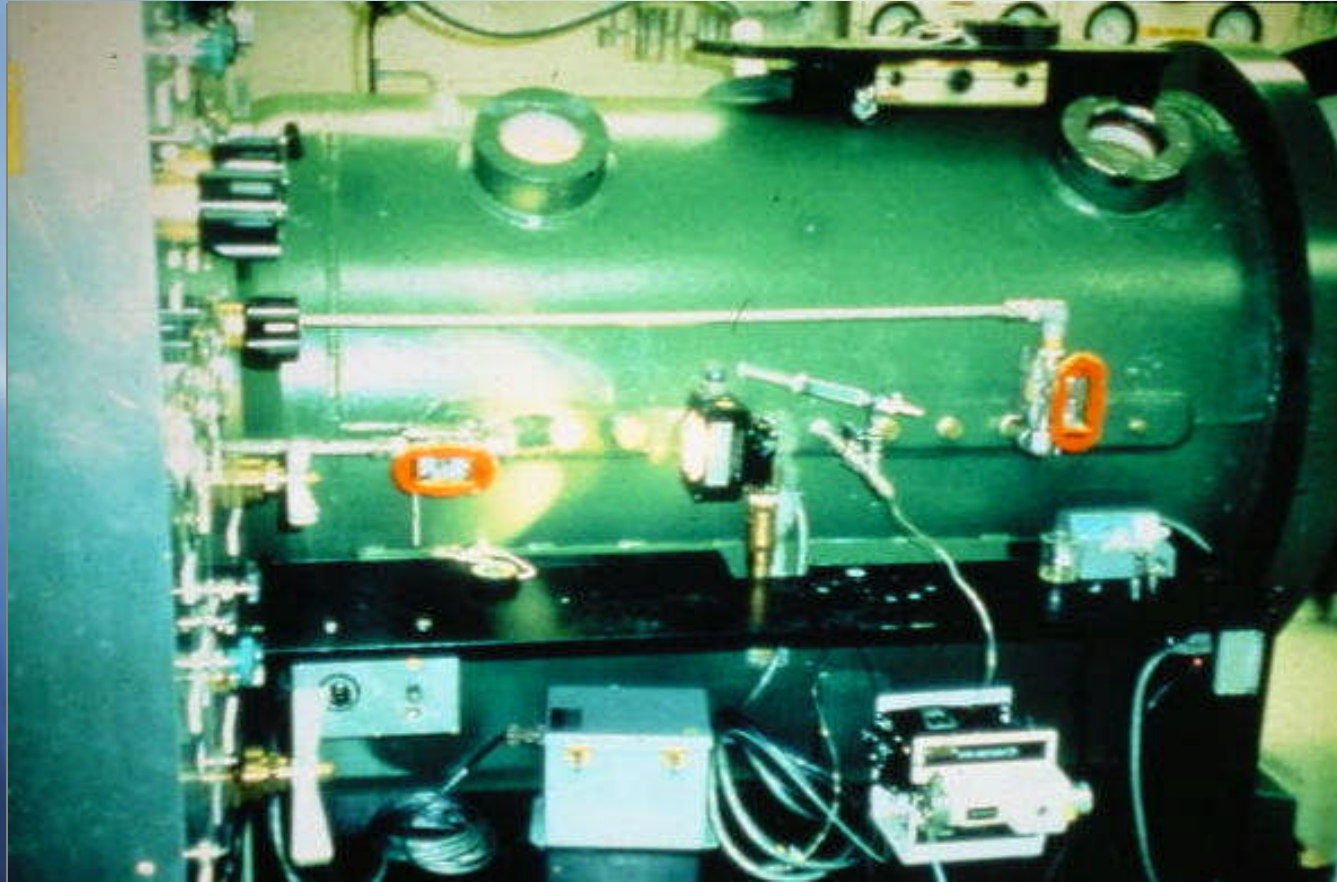
Needles



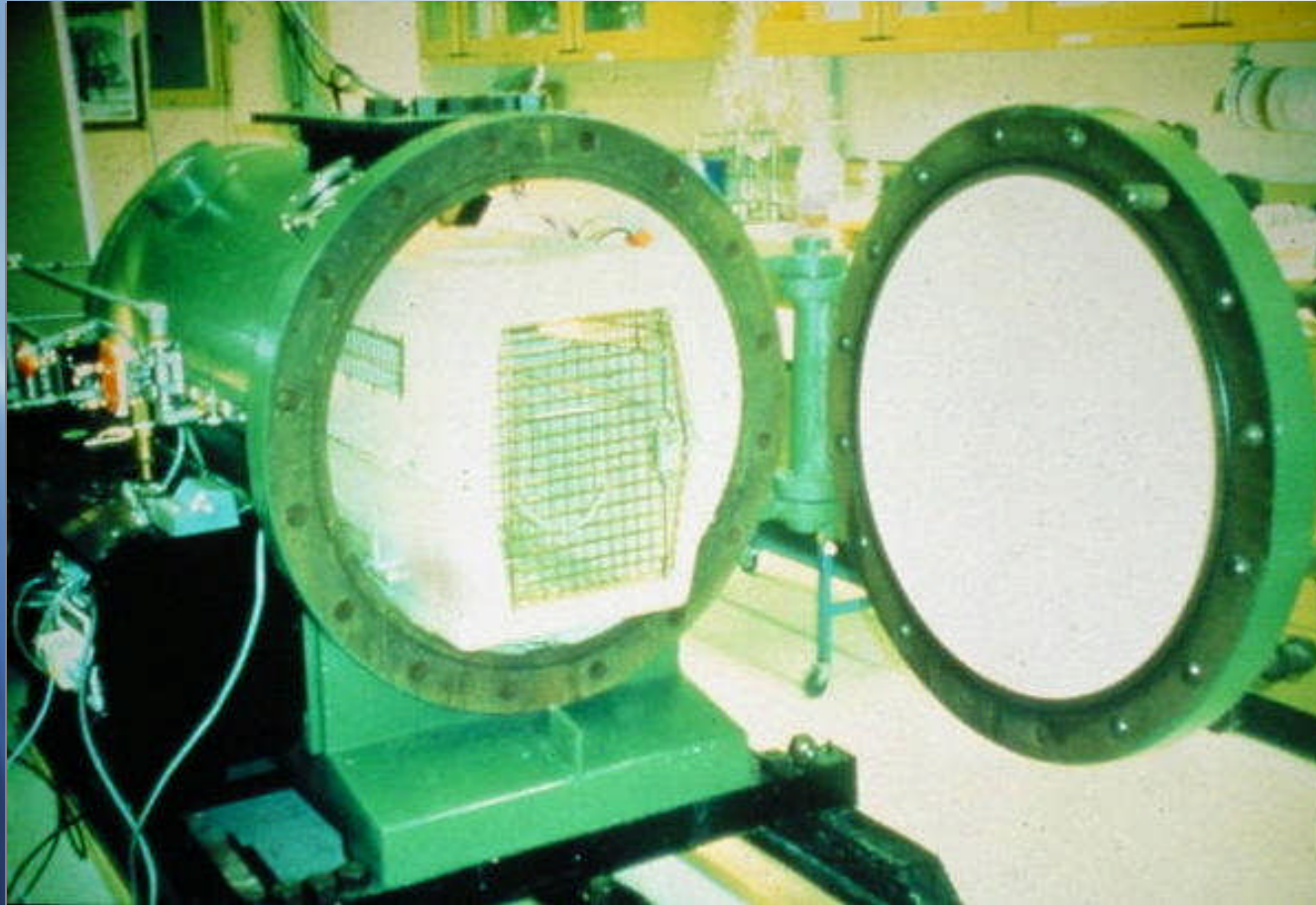
- Hypodermic
- Huber point
- Tubing adapter



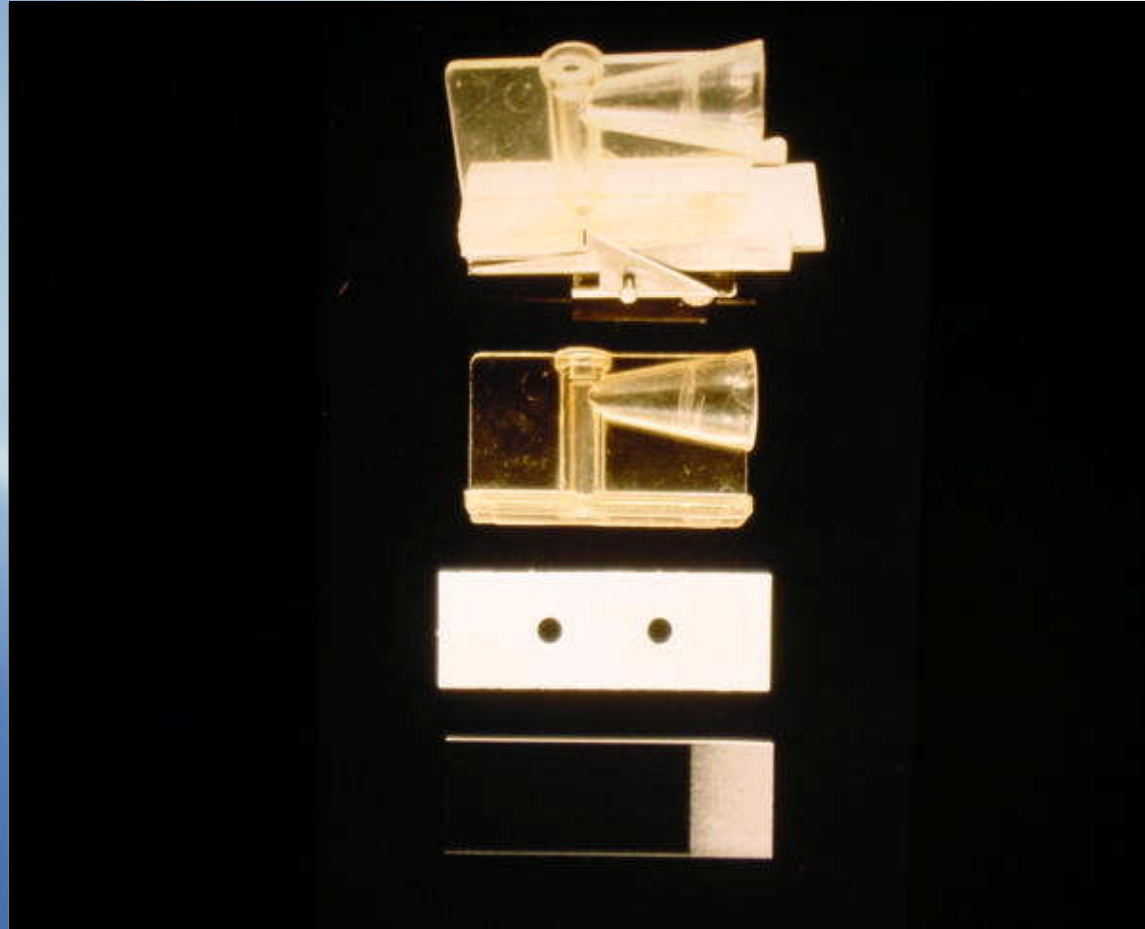
Hyperbaric chamber



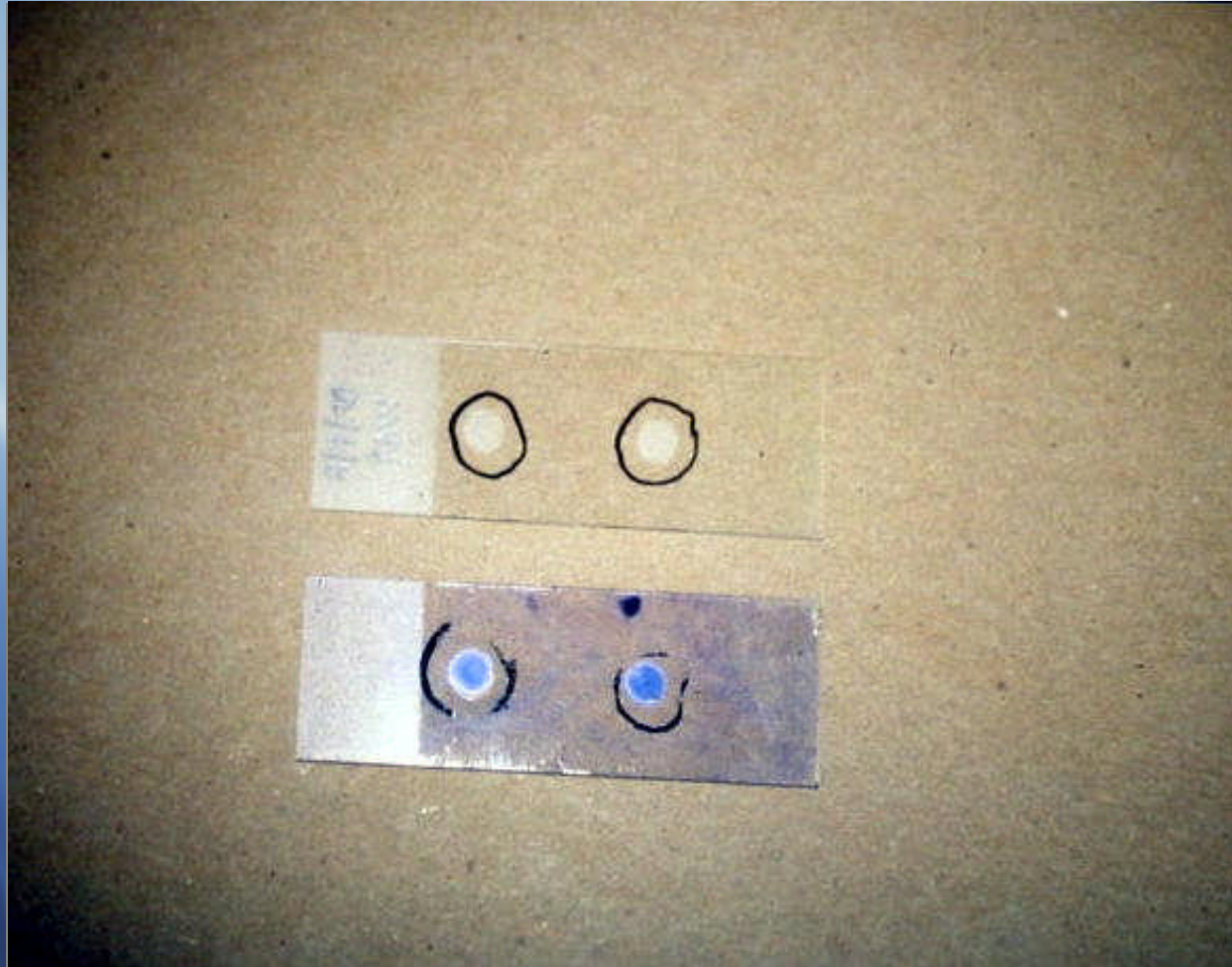
Hyperbaric chamber



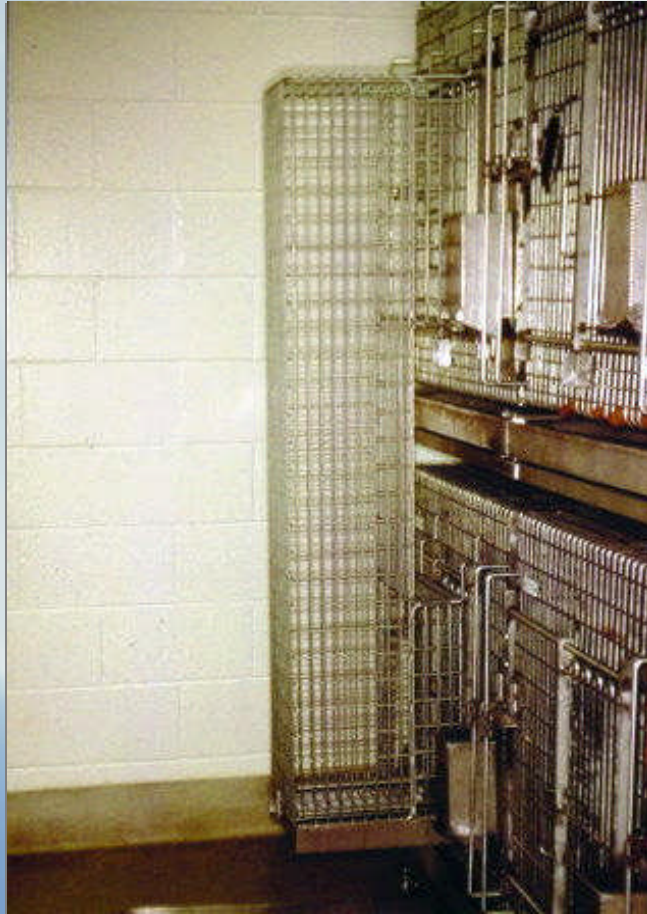
Cytospin prep



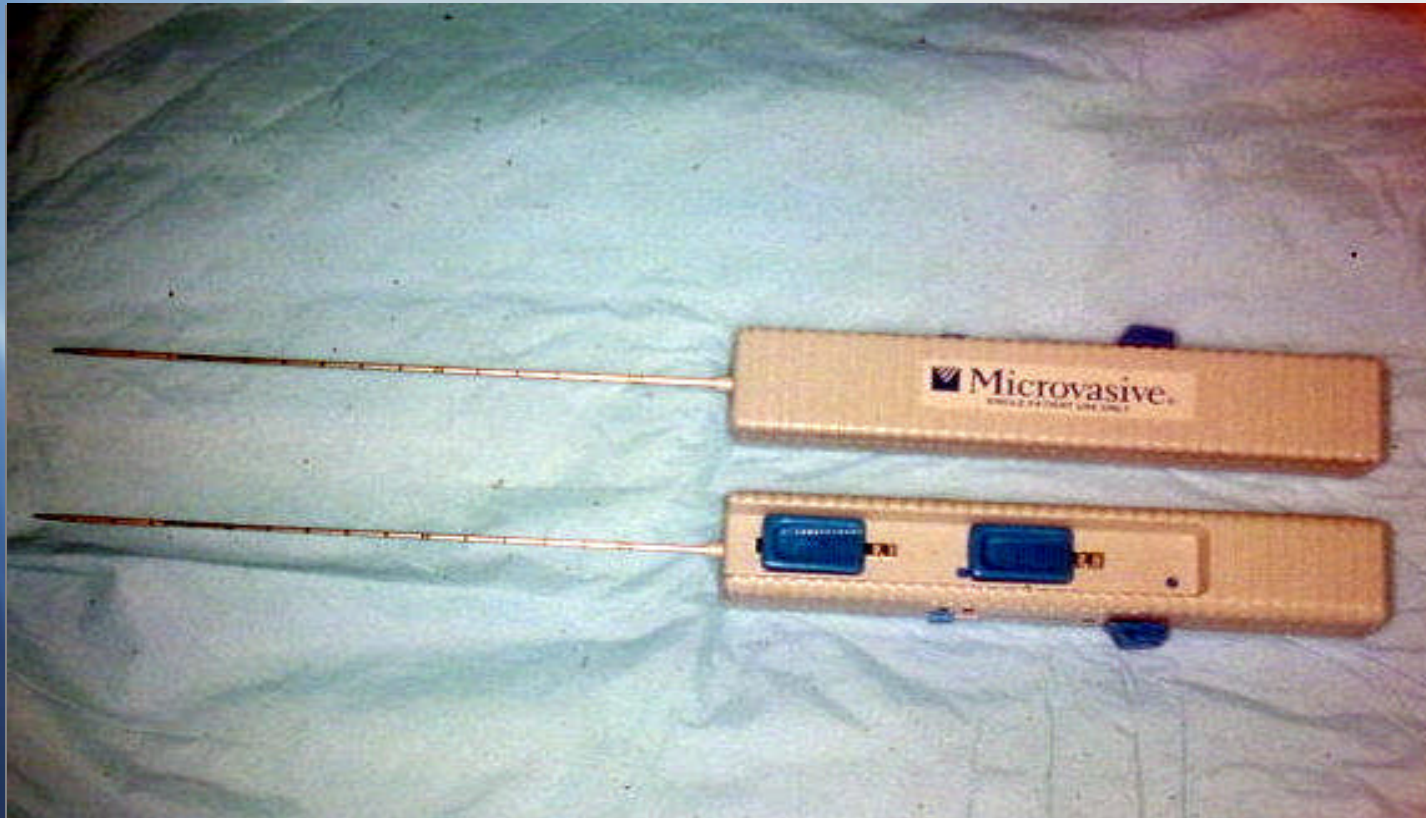
Slides from Cytospin



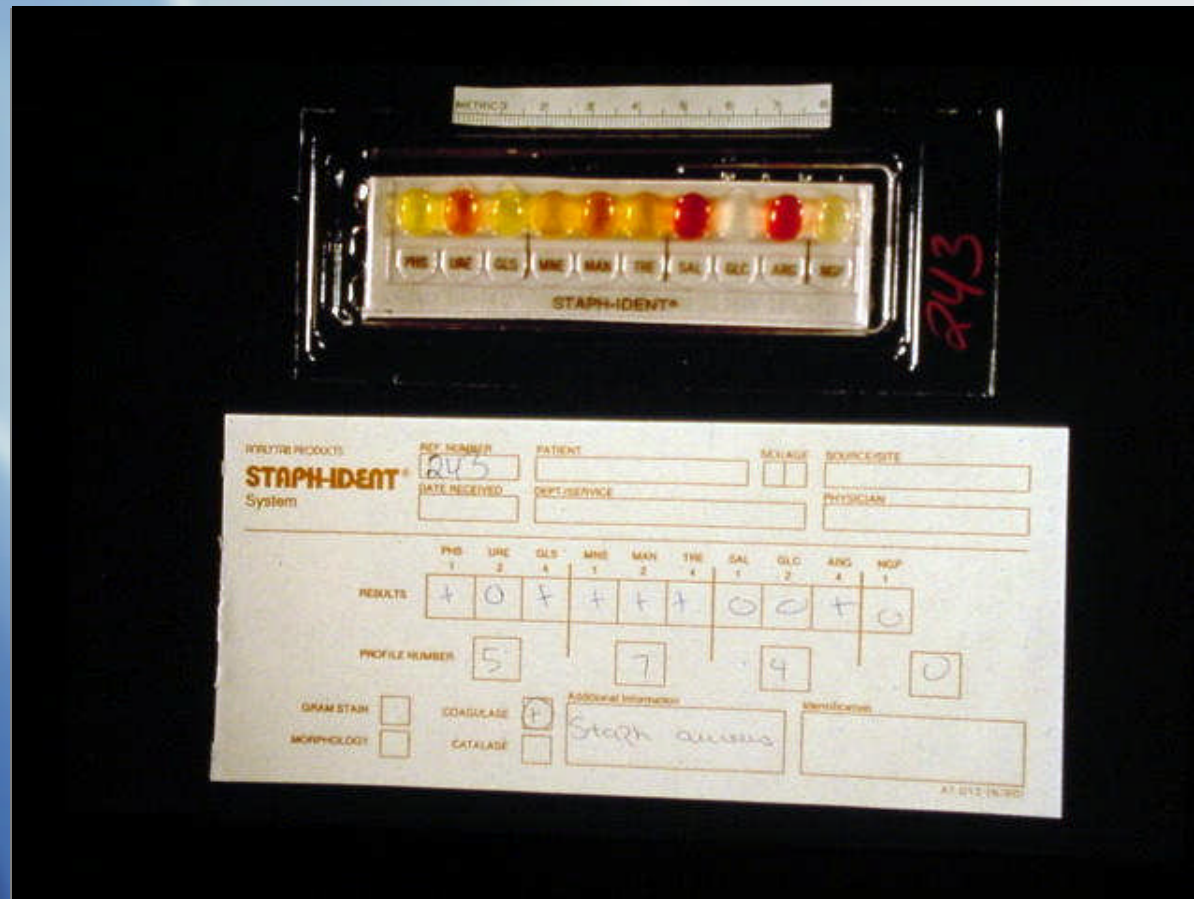
Monkey transfer tunnel



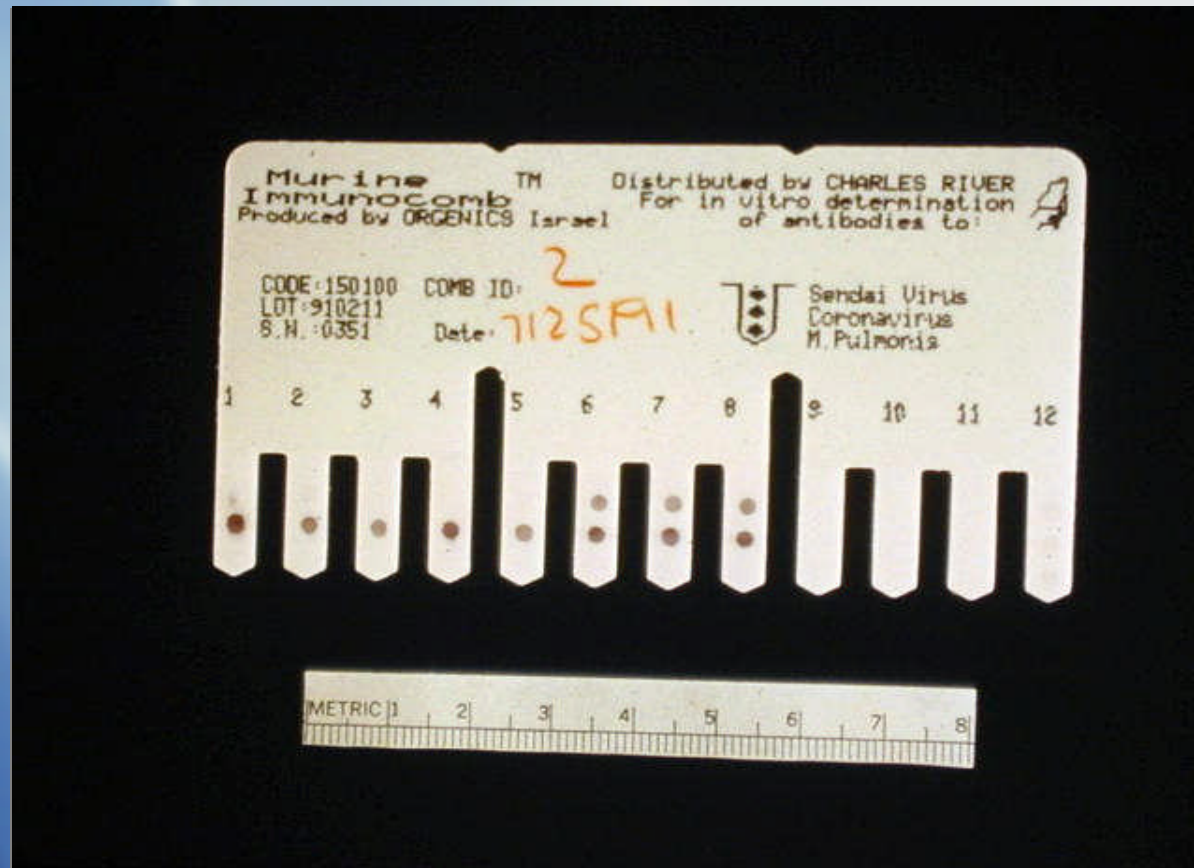
Needle biopsy gun



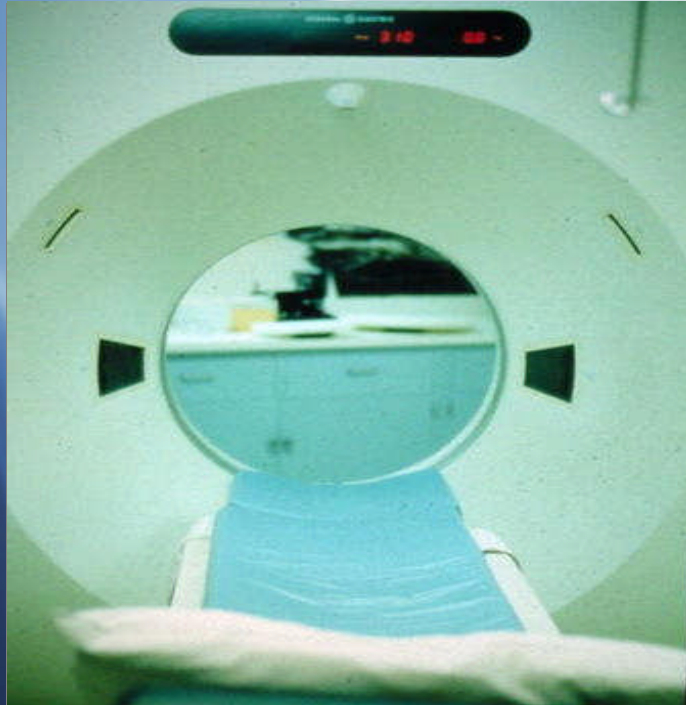
API strip



Immunocomb



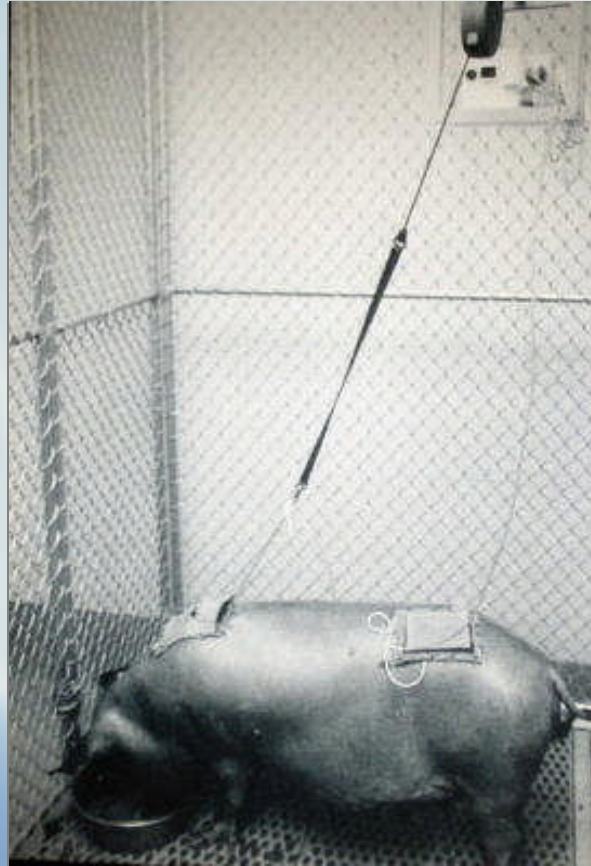
CAT scanner



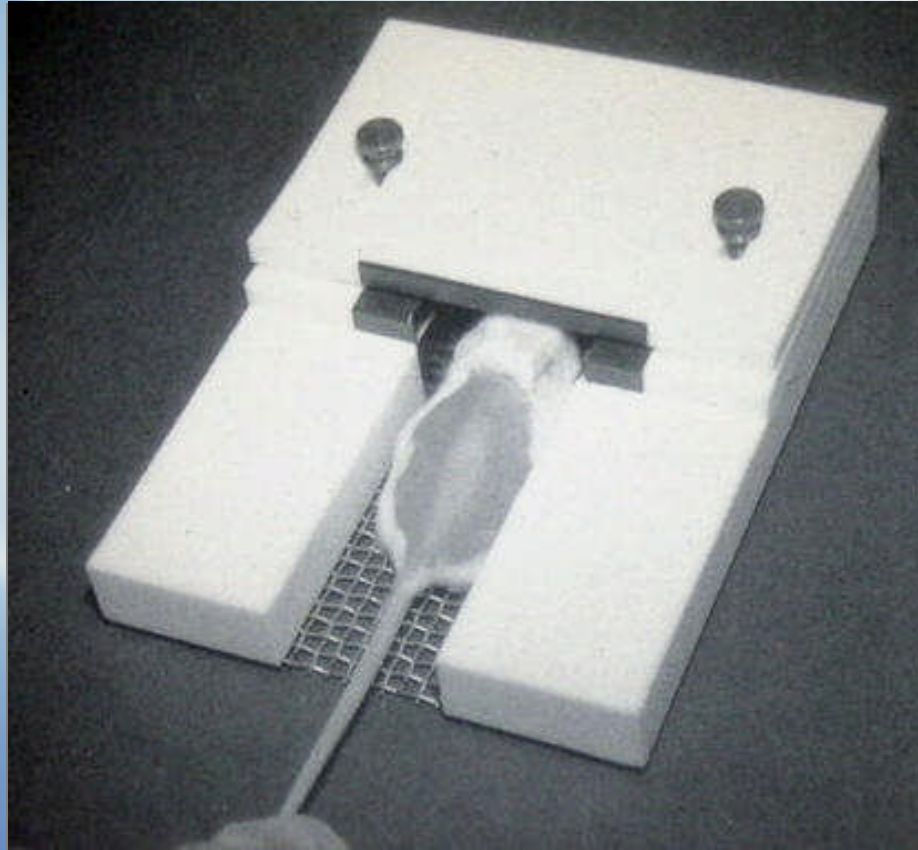
Normal CT scan of Rhesus Arrows are Lateral Ventricles



Pig infusion/tether



Mouse restraint for skin examination



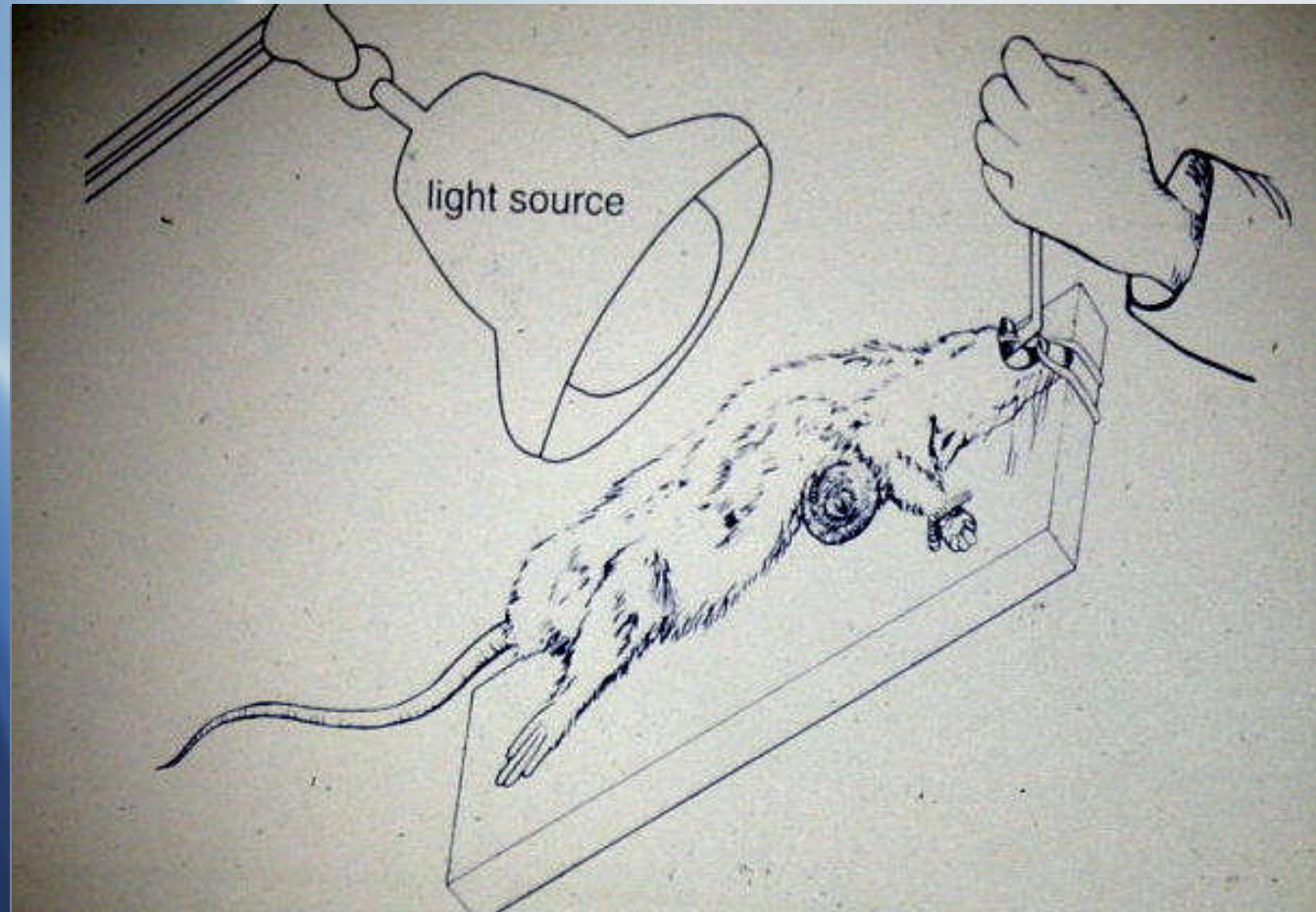
Dacryo cyctorhinograph in rabbit
Arrow is nasolacrima duct



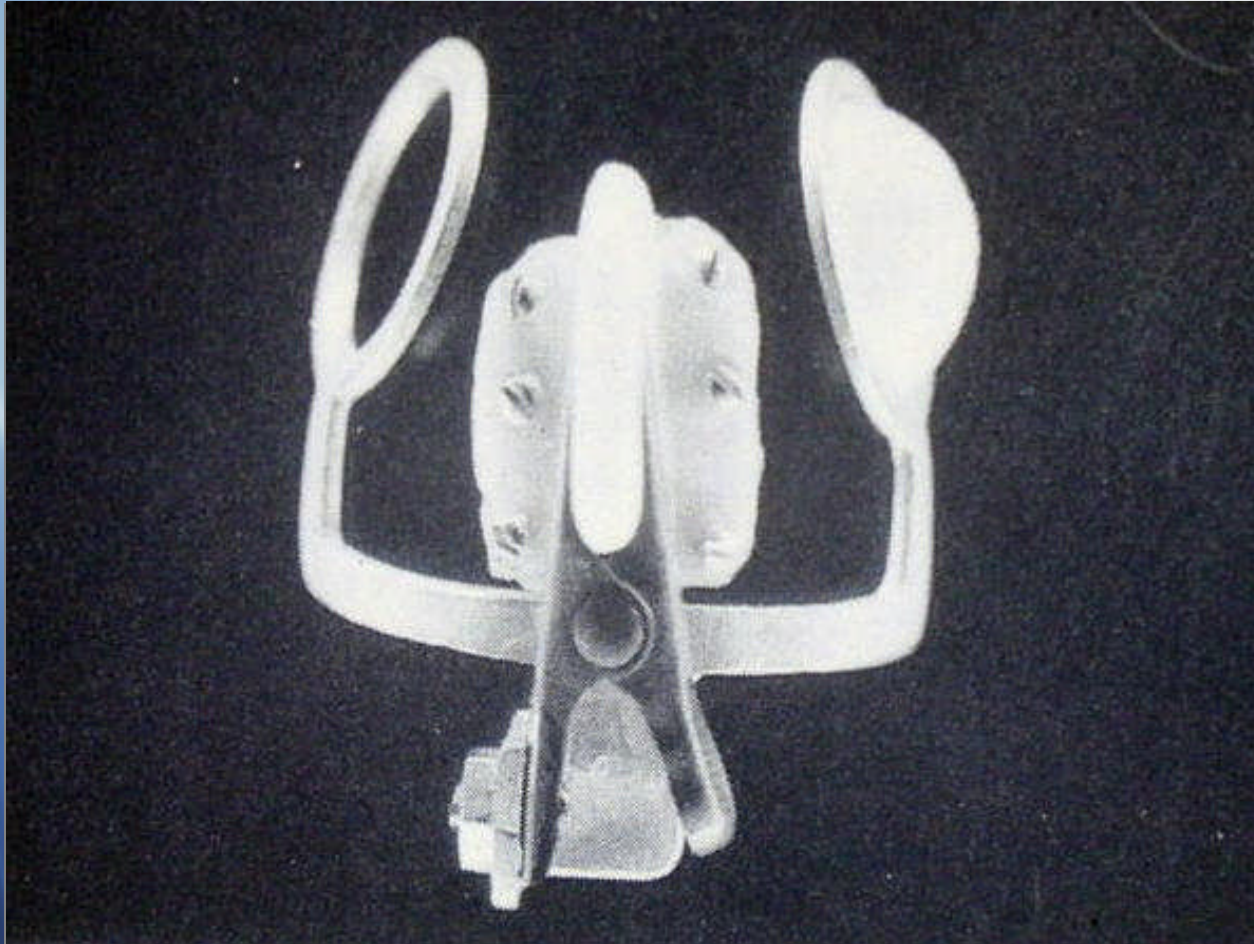
Anogenital distance measurement



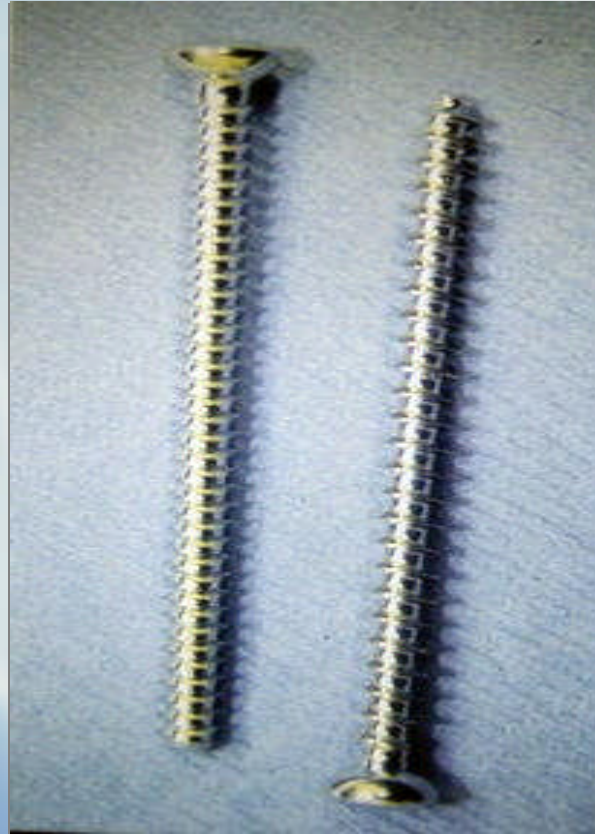
Orotracheal intubation using transillumination



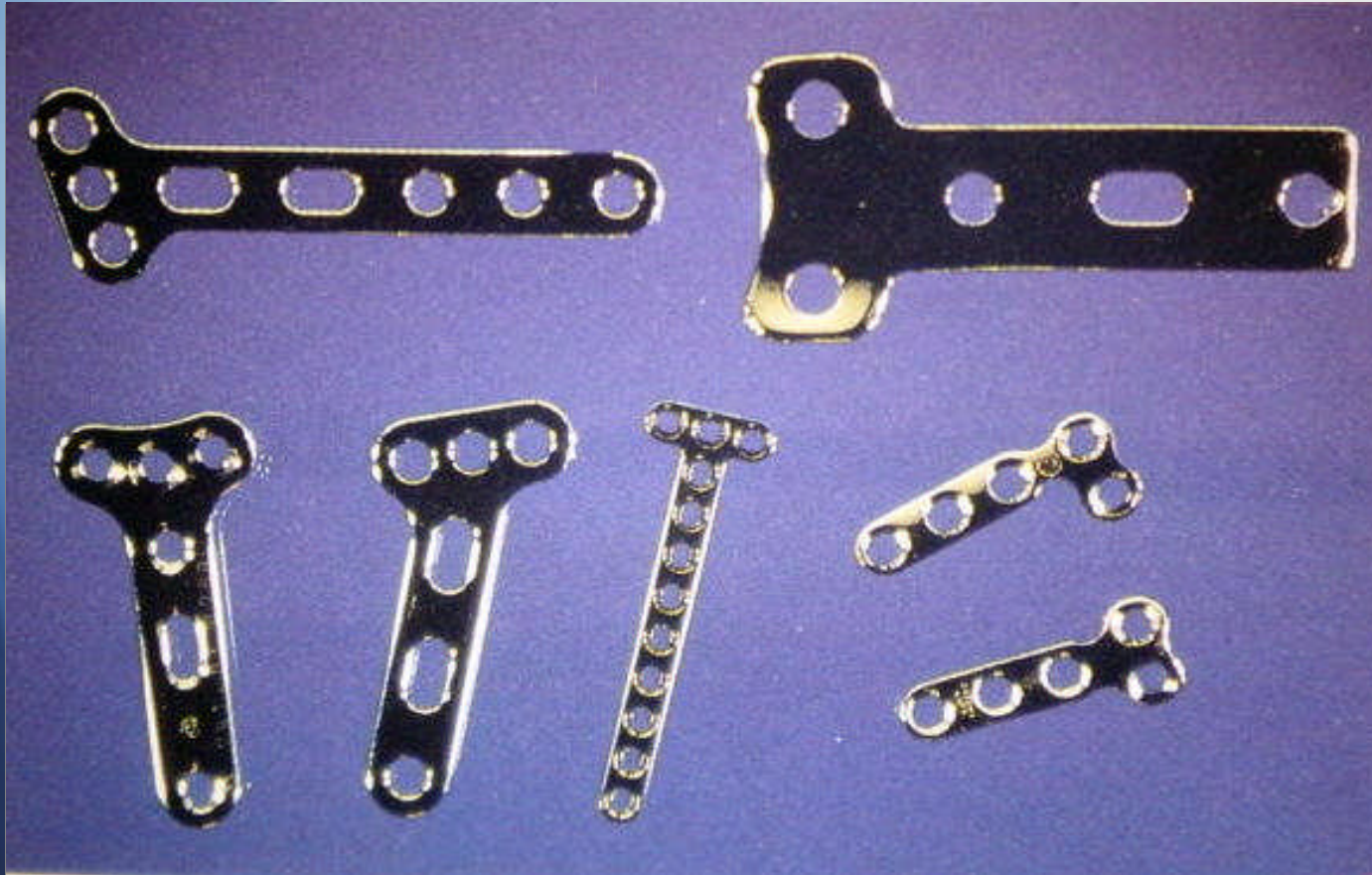
Goggles for controlling visual environment of small animals



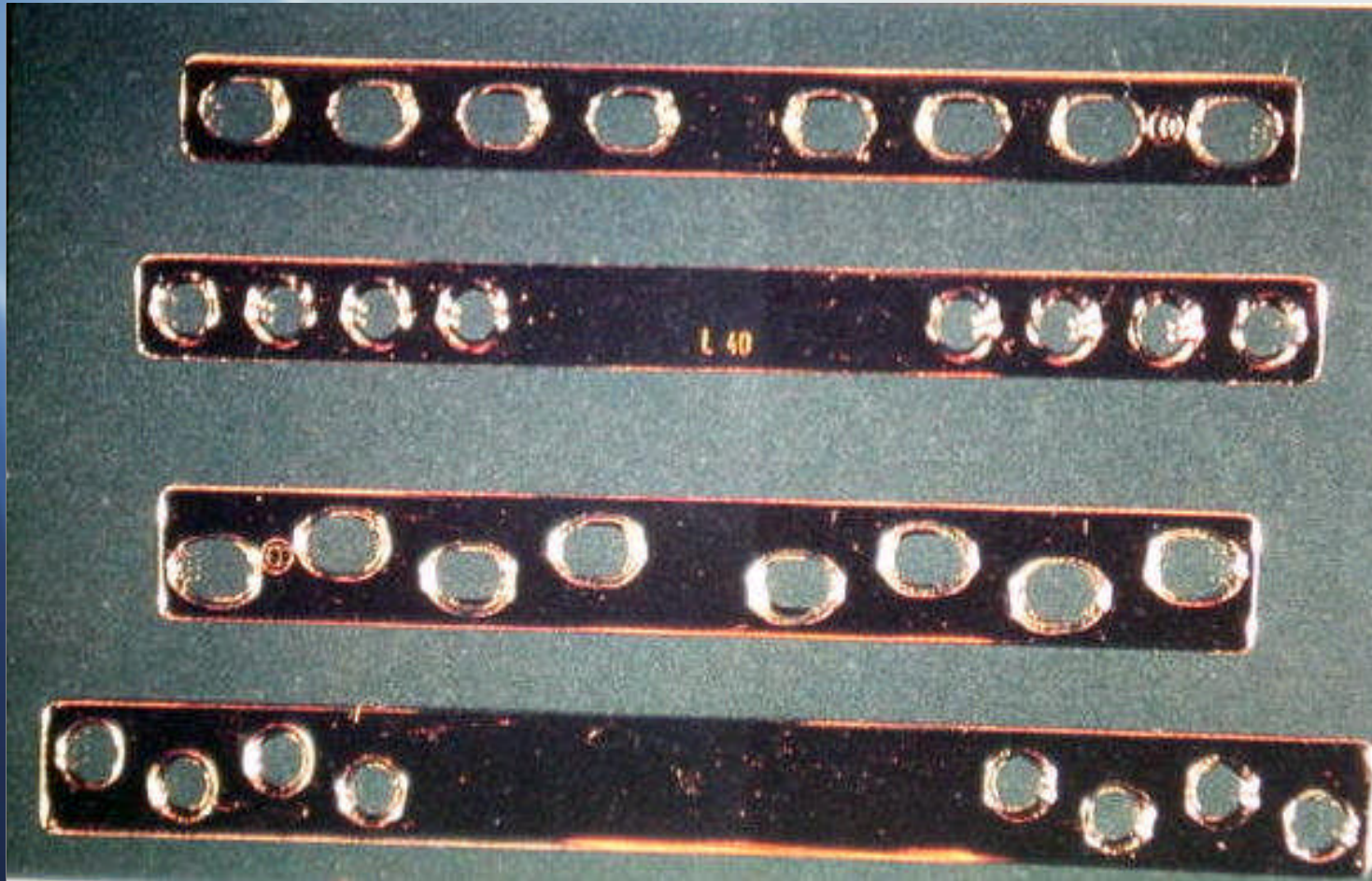
L = Cortical bone screw
R= Cancellous bone screw



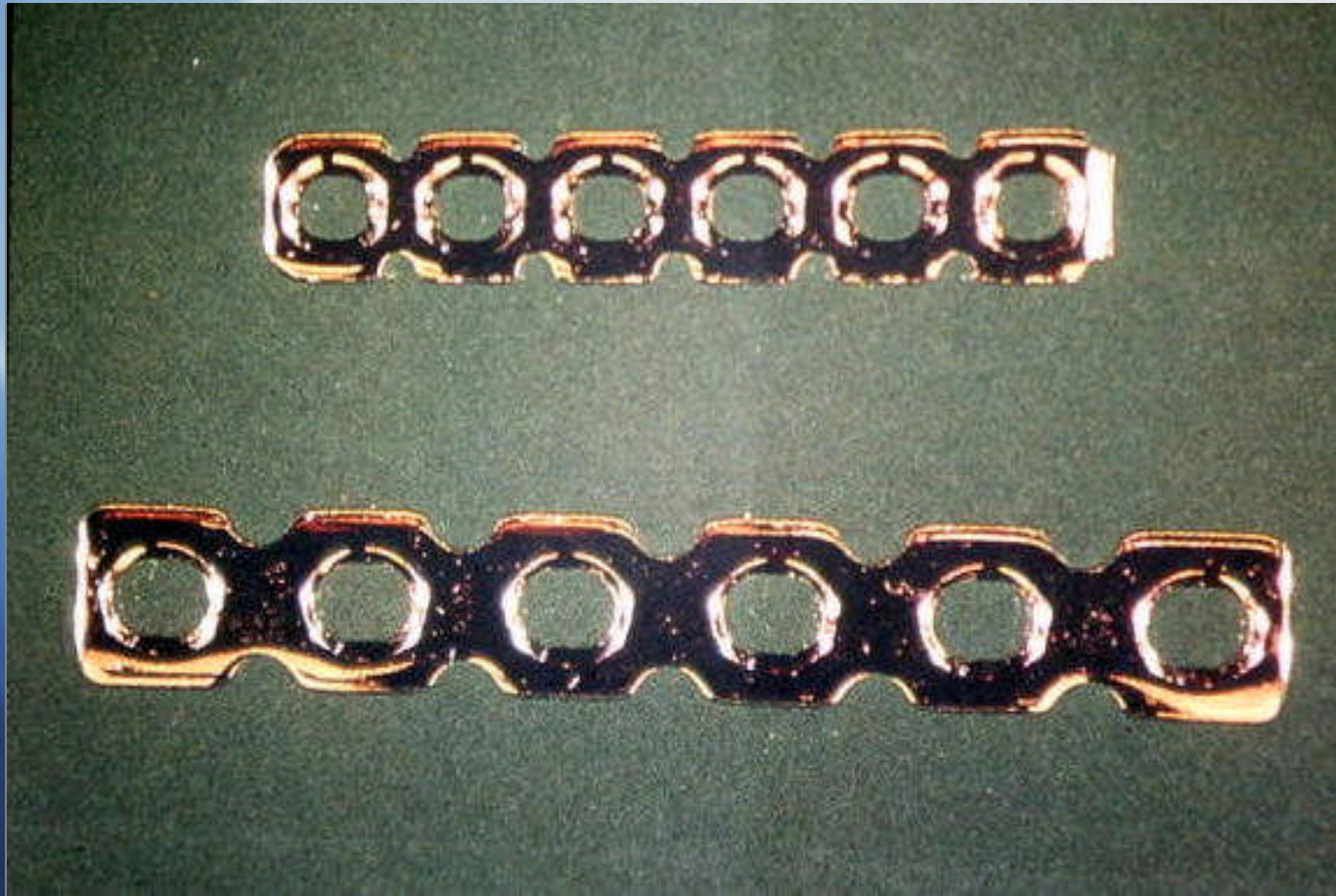
T-plates



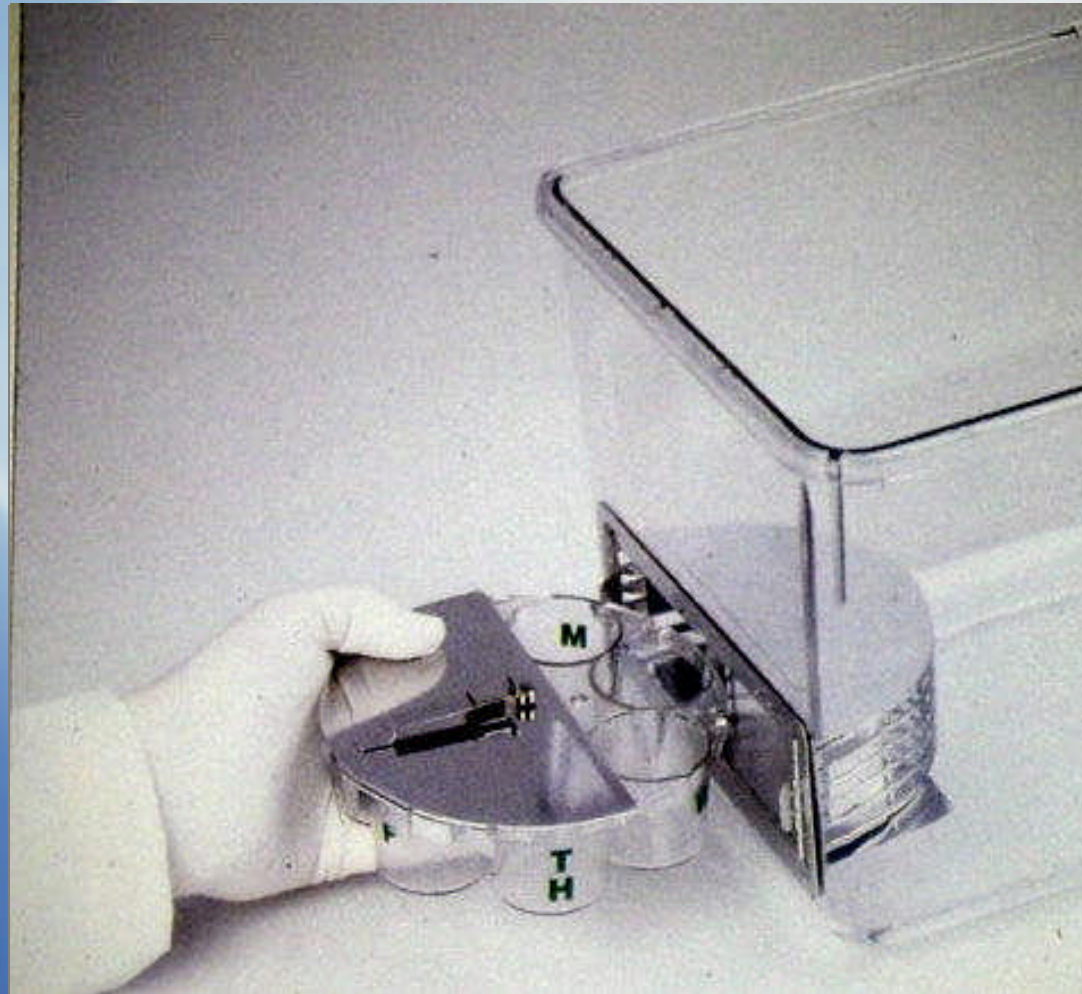
Buttress plates



Reconstruction plates for irregularly-shaped bones



Carousel feeder for diet optimization



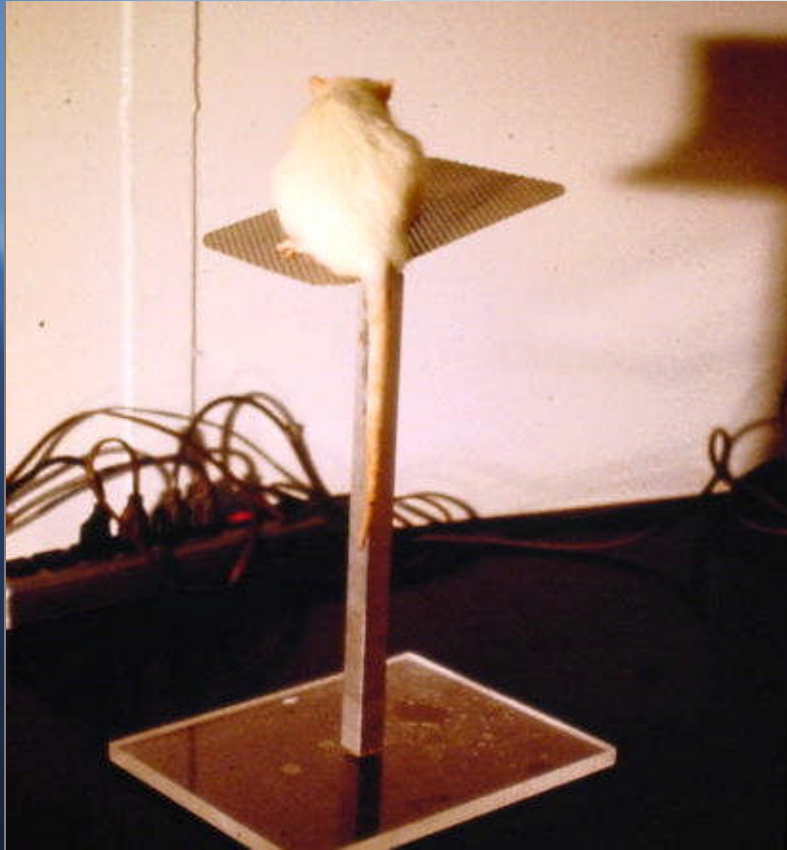
Shock avoidance system



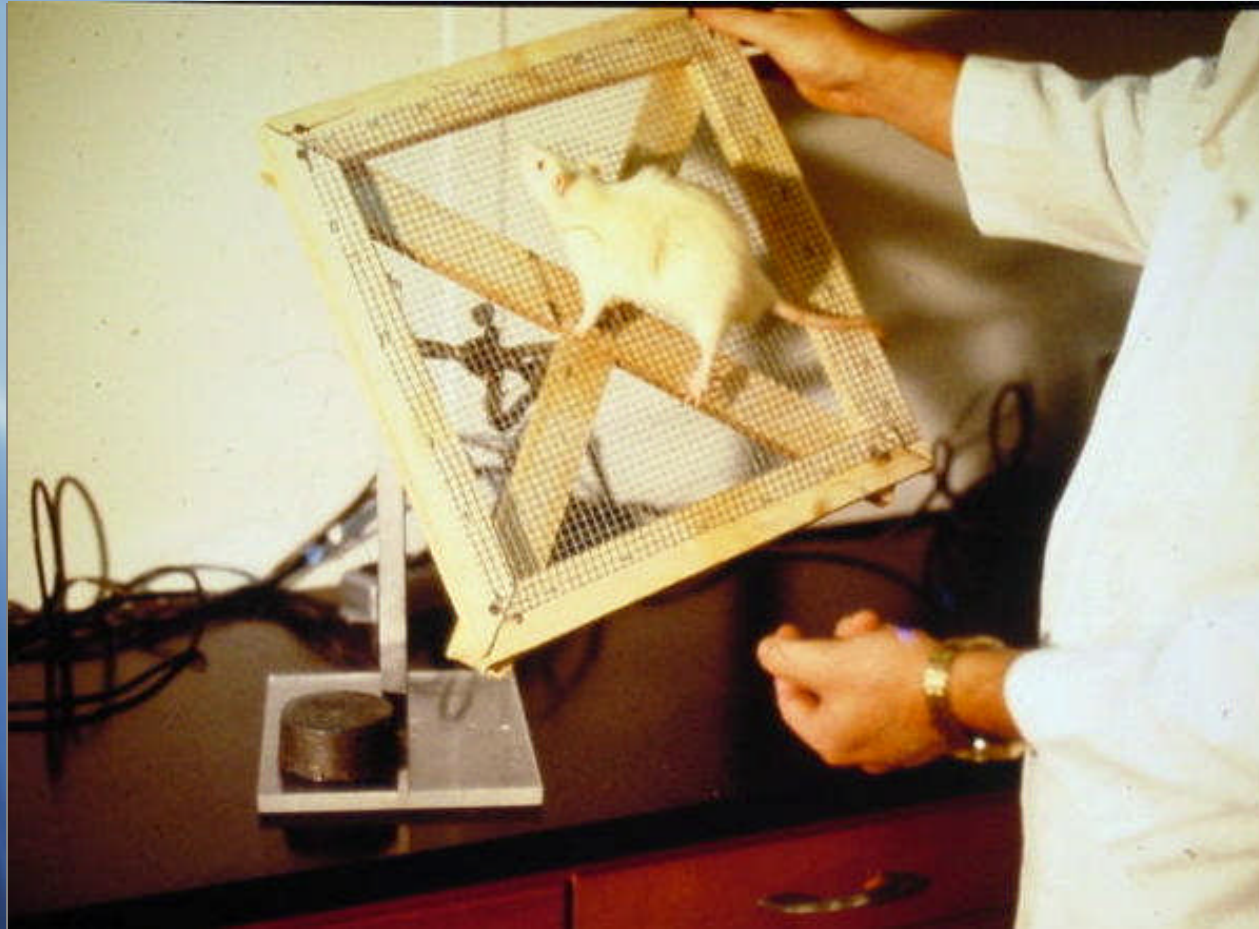
- Passive avoidance: door open, one side dark, go from light to dark, door closes, shock. Learn not to go to dark side
- Active avoidance: both sides light and open in between, light, tone & shock, escape to other side to avoid shock



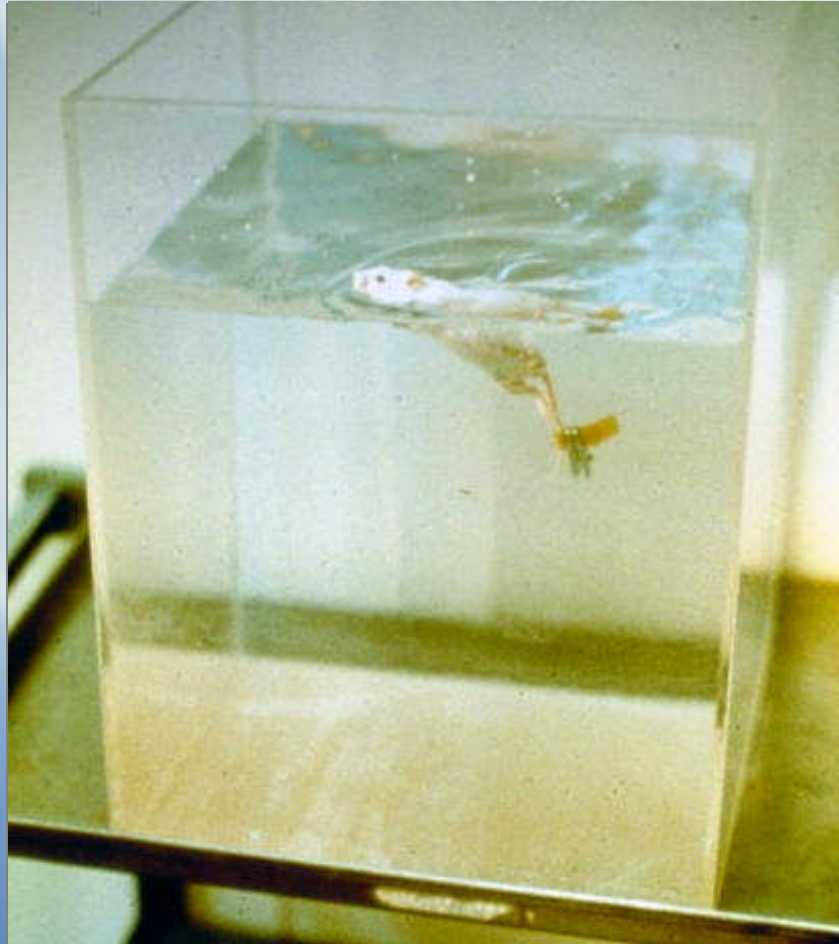
Unsteady stand



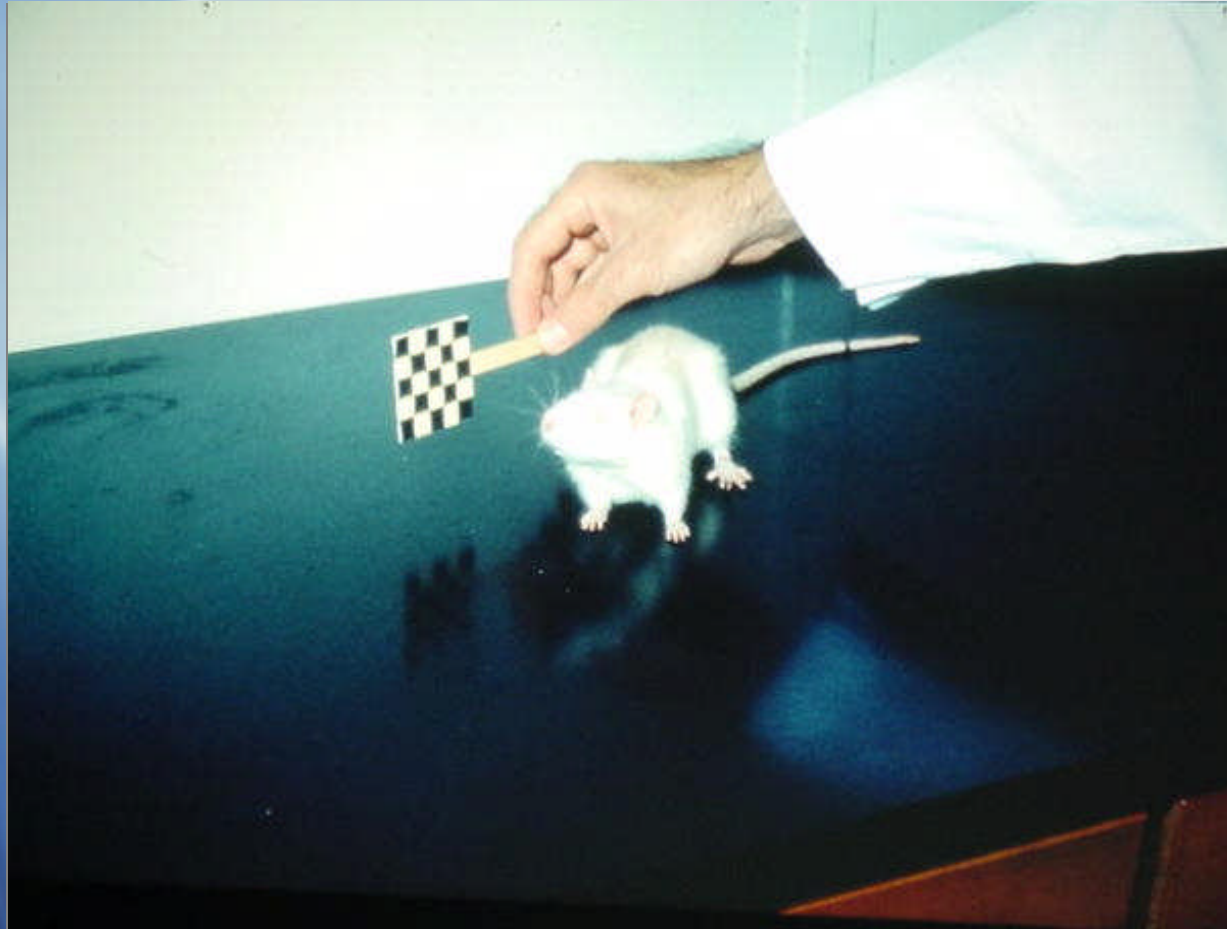
Neagive geotaxis



Swim endurance



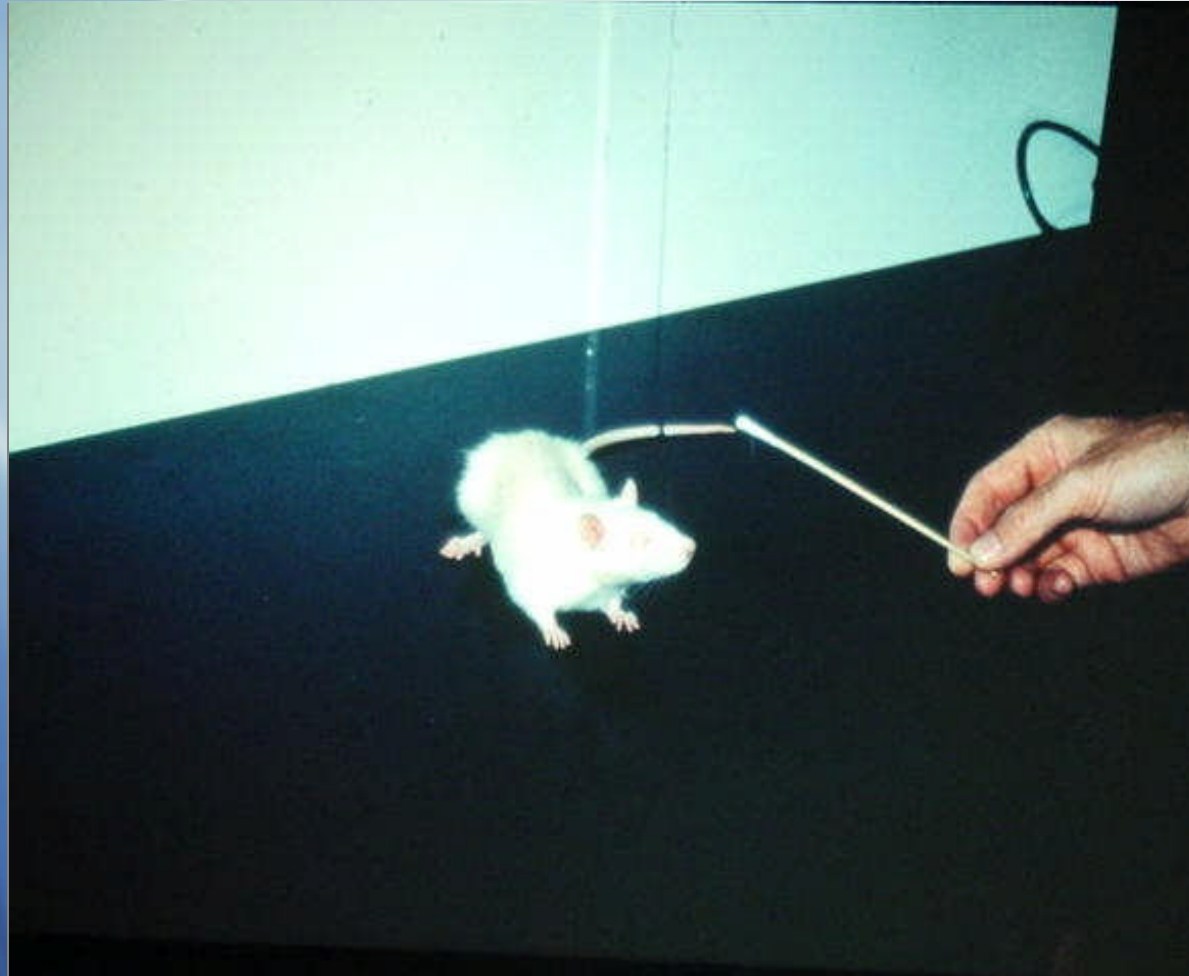
Visual orientation



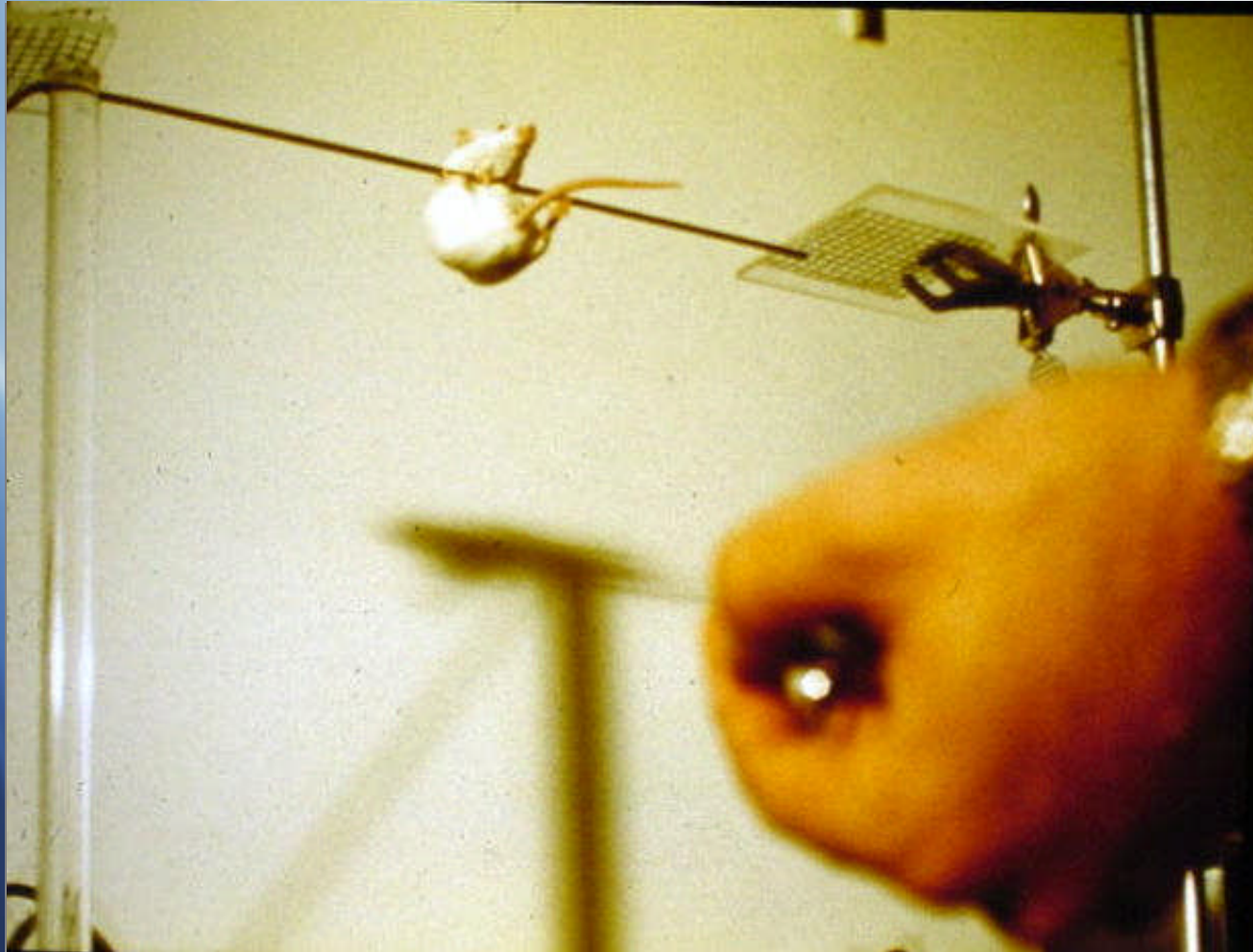
Auditory orientation



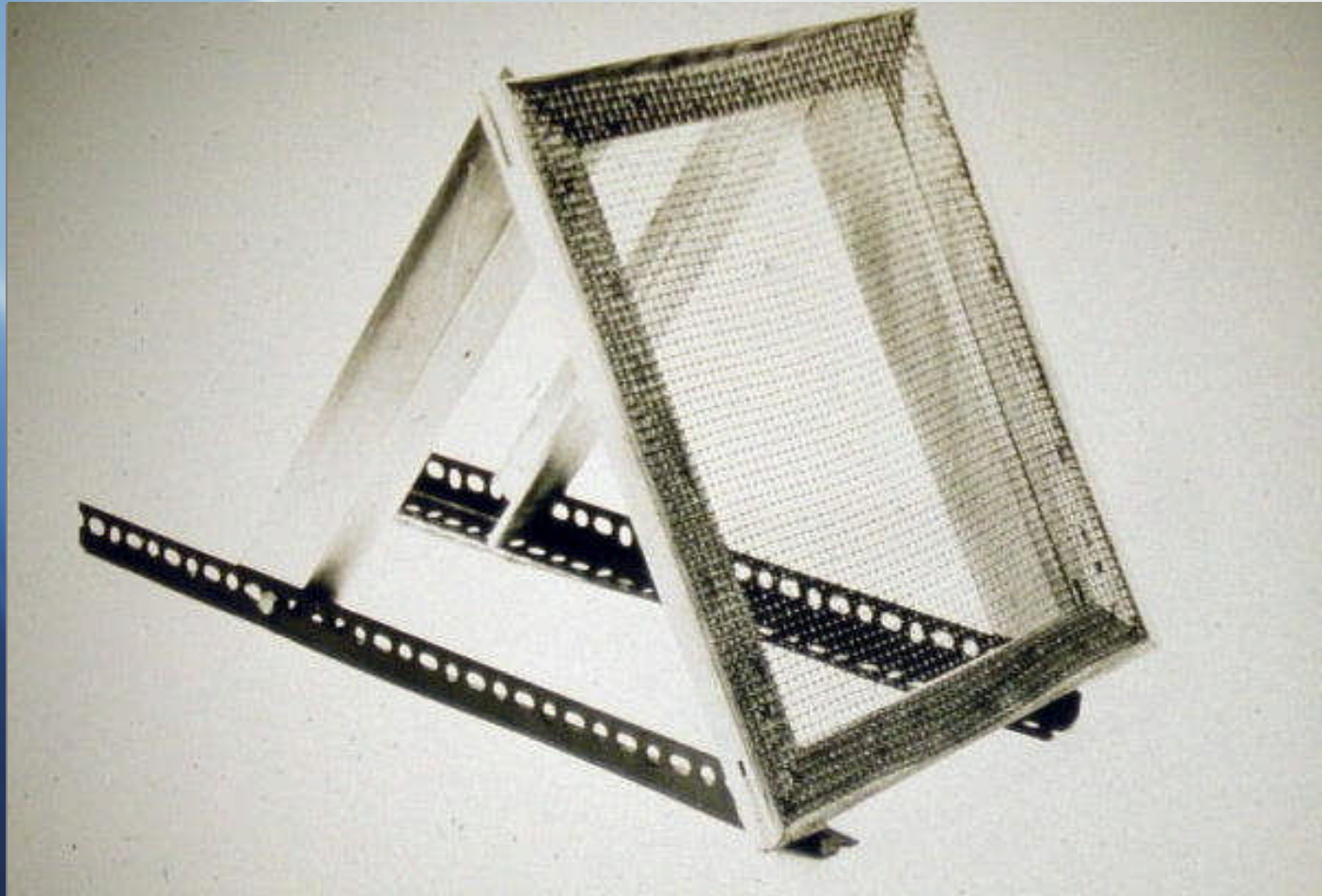
Olfactory orientation



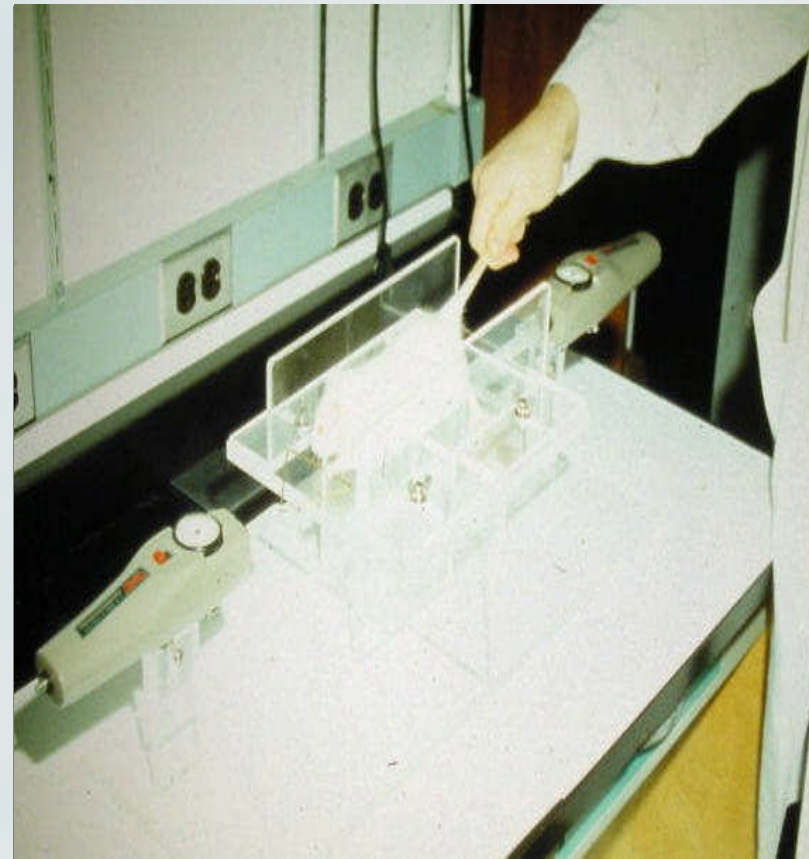
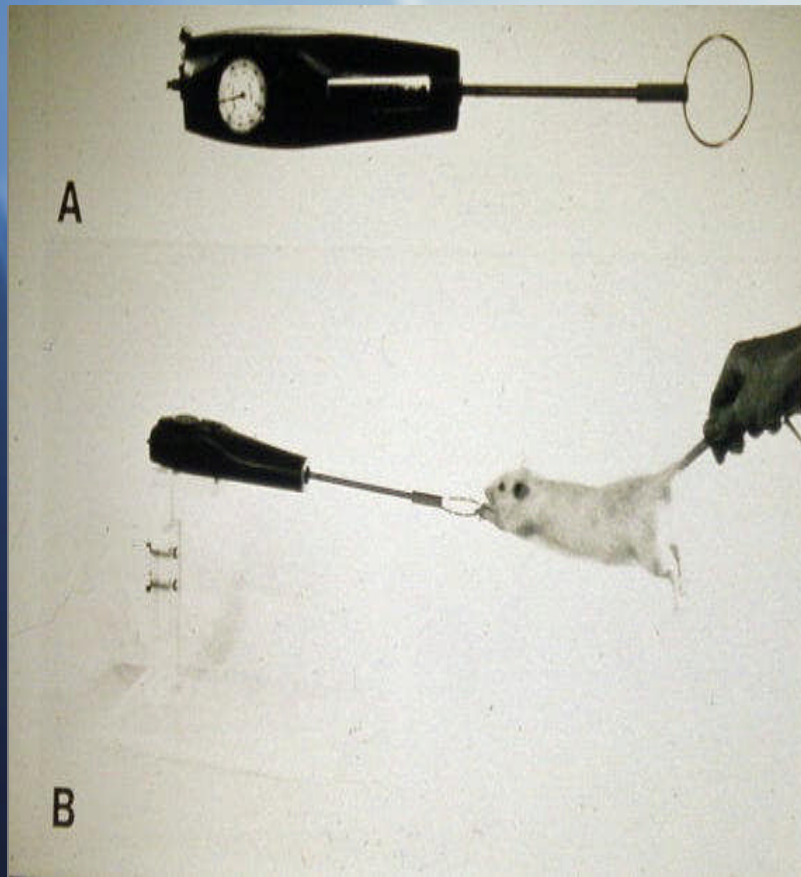
Rope walk measures motor coordination



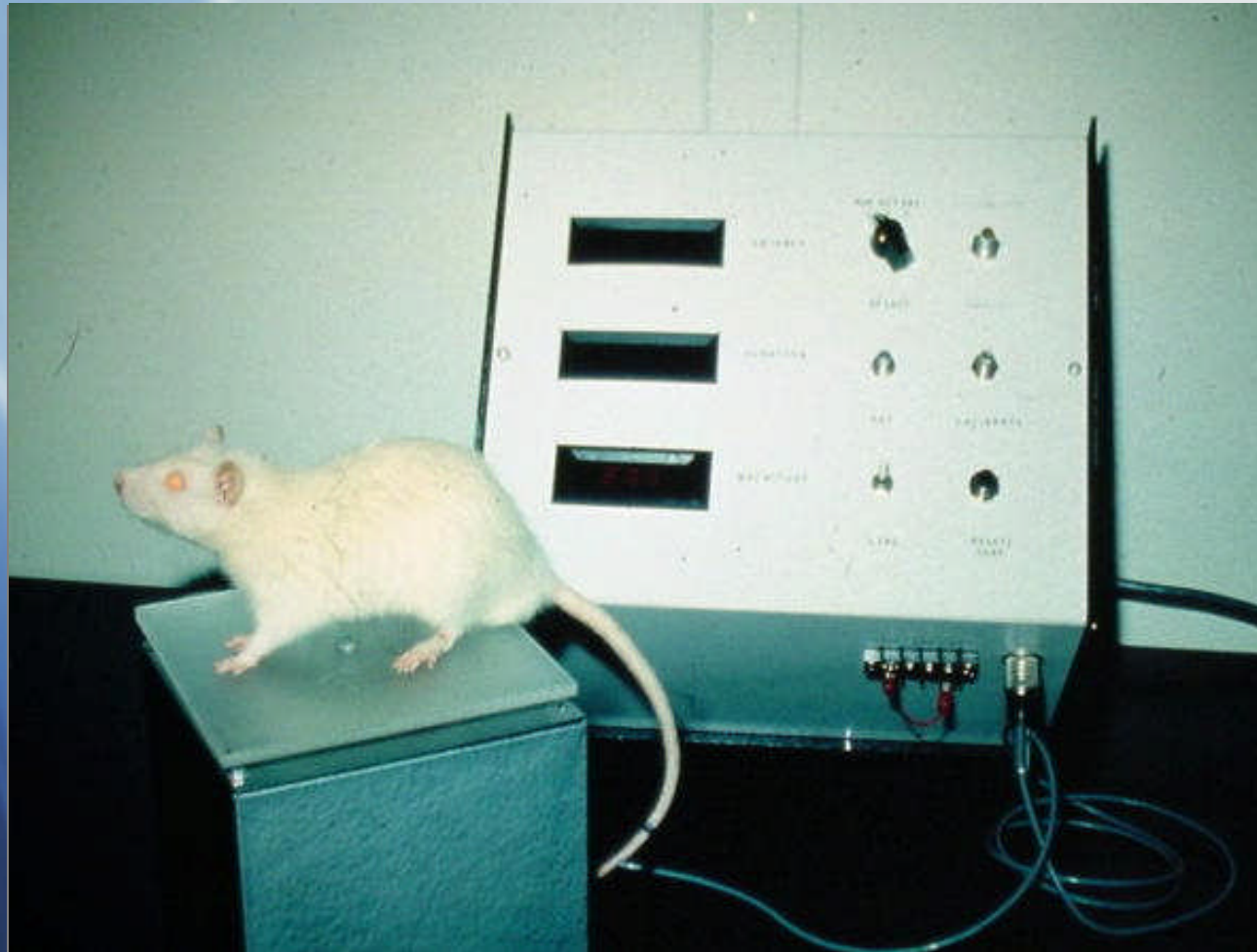
***Inclined screen
part of functional observational battery
(FOB)***



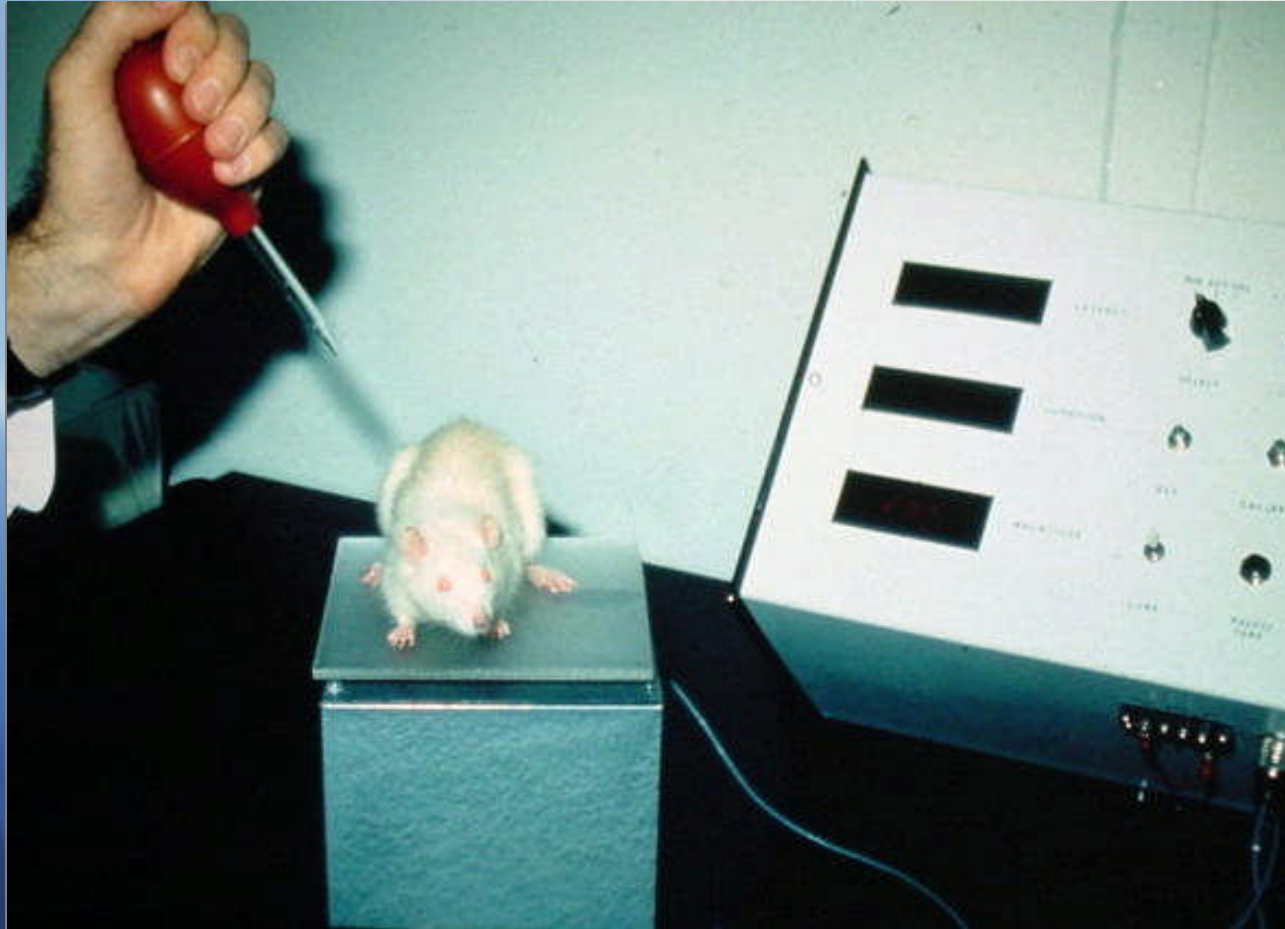
Forelimb grip



Analgesia meter with rat



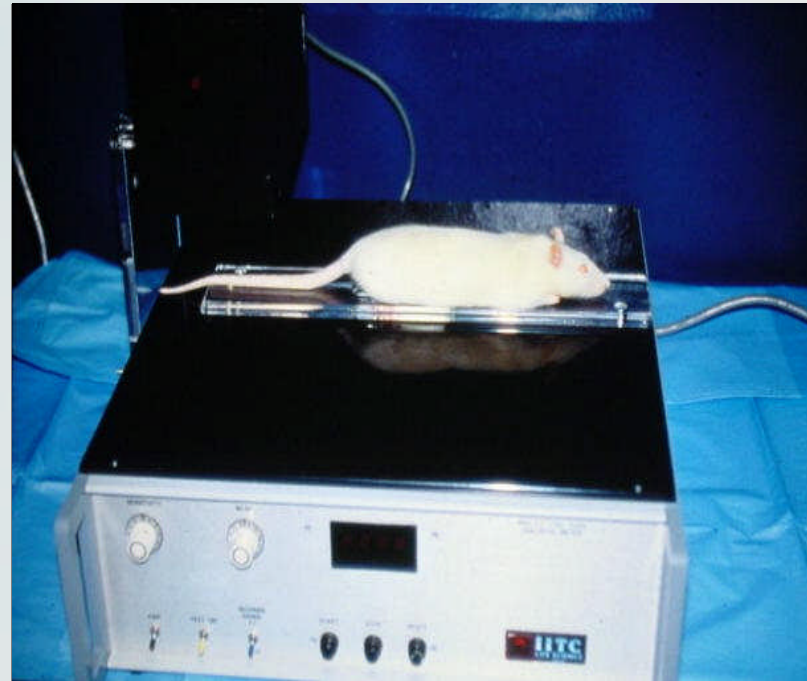
Air puff startle



Analgesia meter



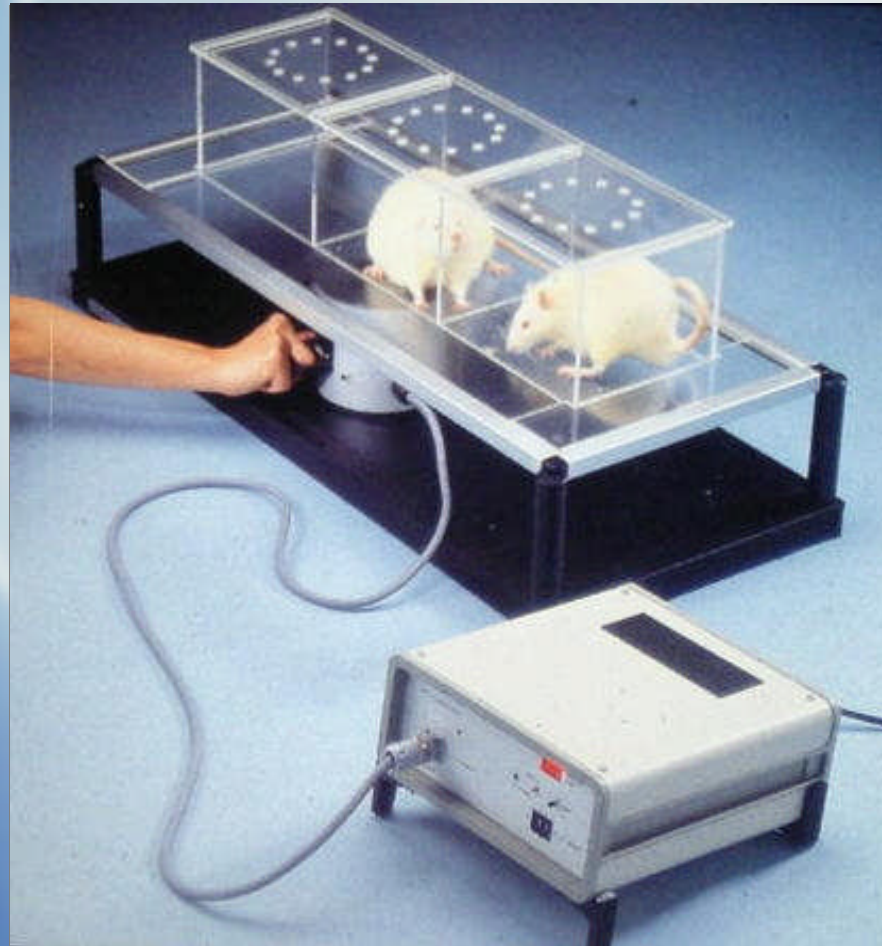
Tail flick (hot)



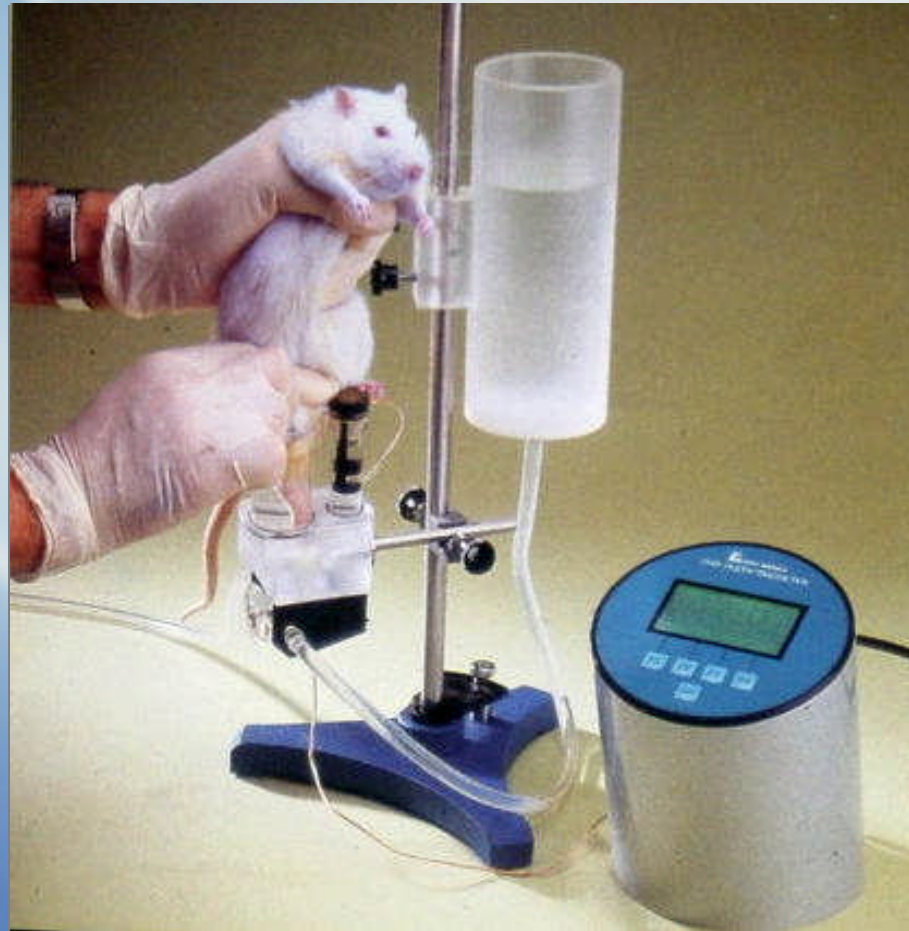
Tail flick (cold)



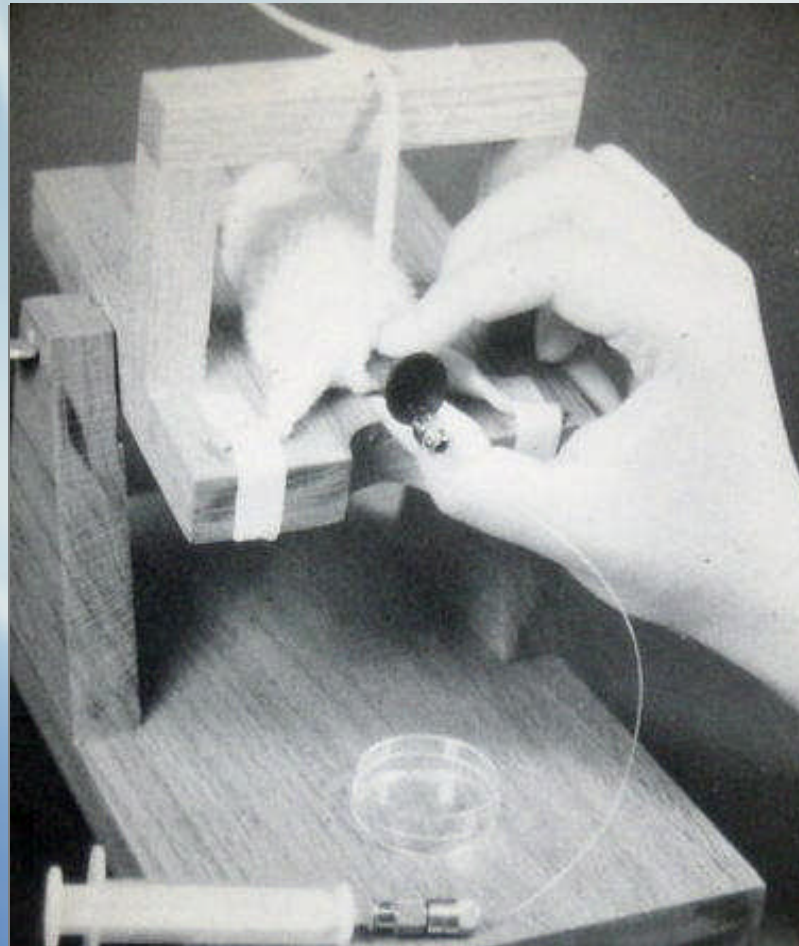
Plantar test



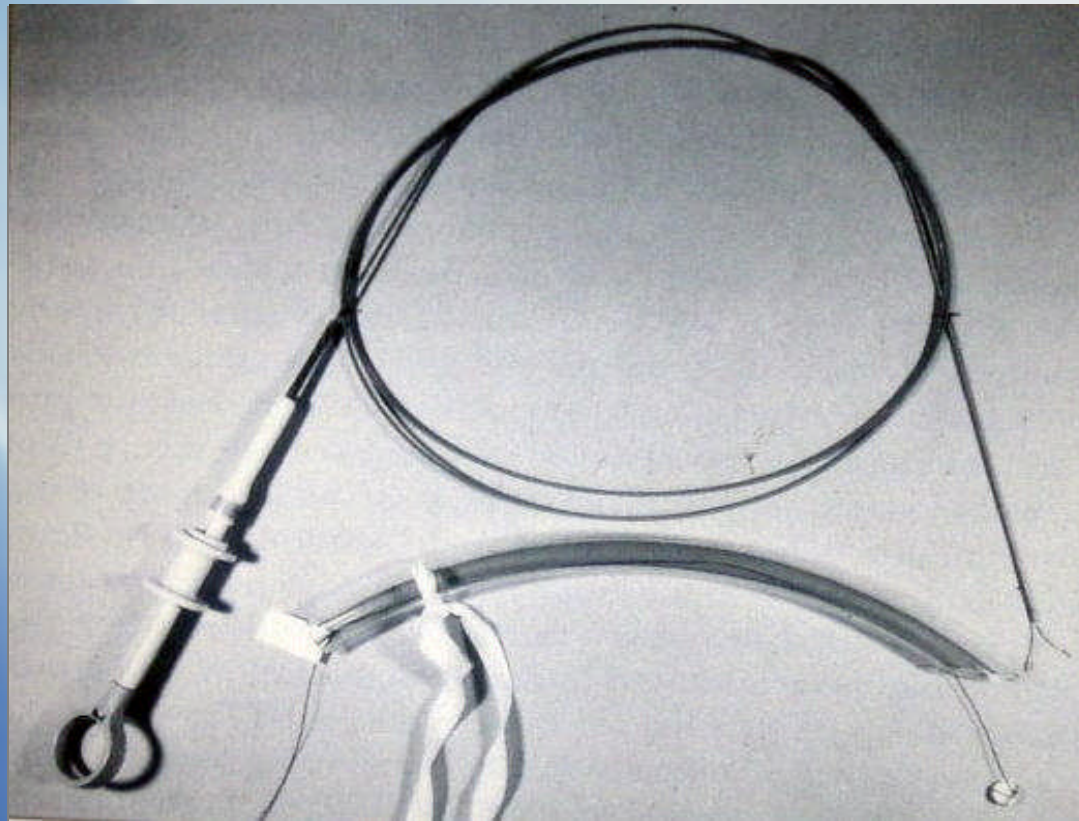
Plesthymometer precisely measures swelling of paw



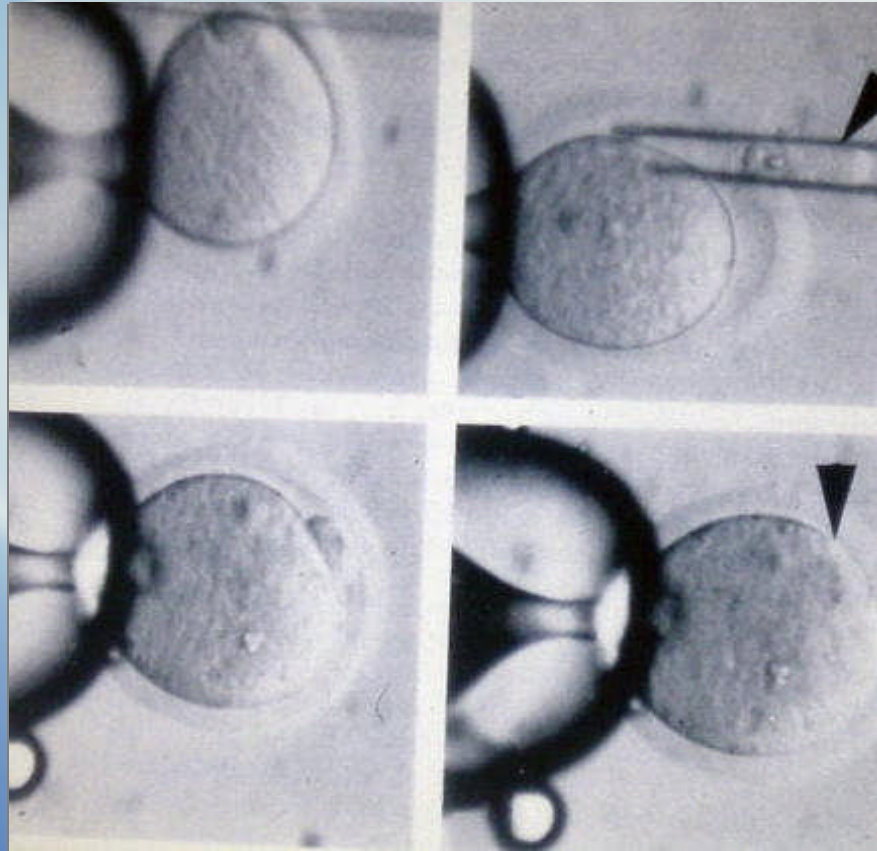
Flushing sperm from a recently bred female mouse



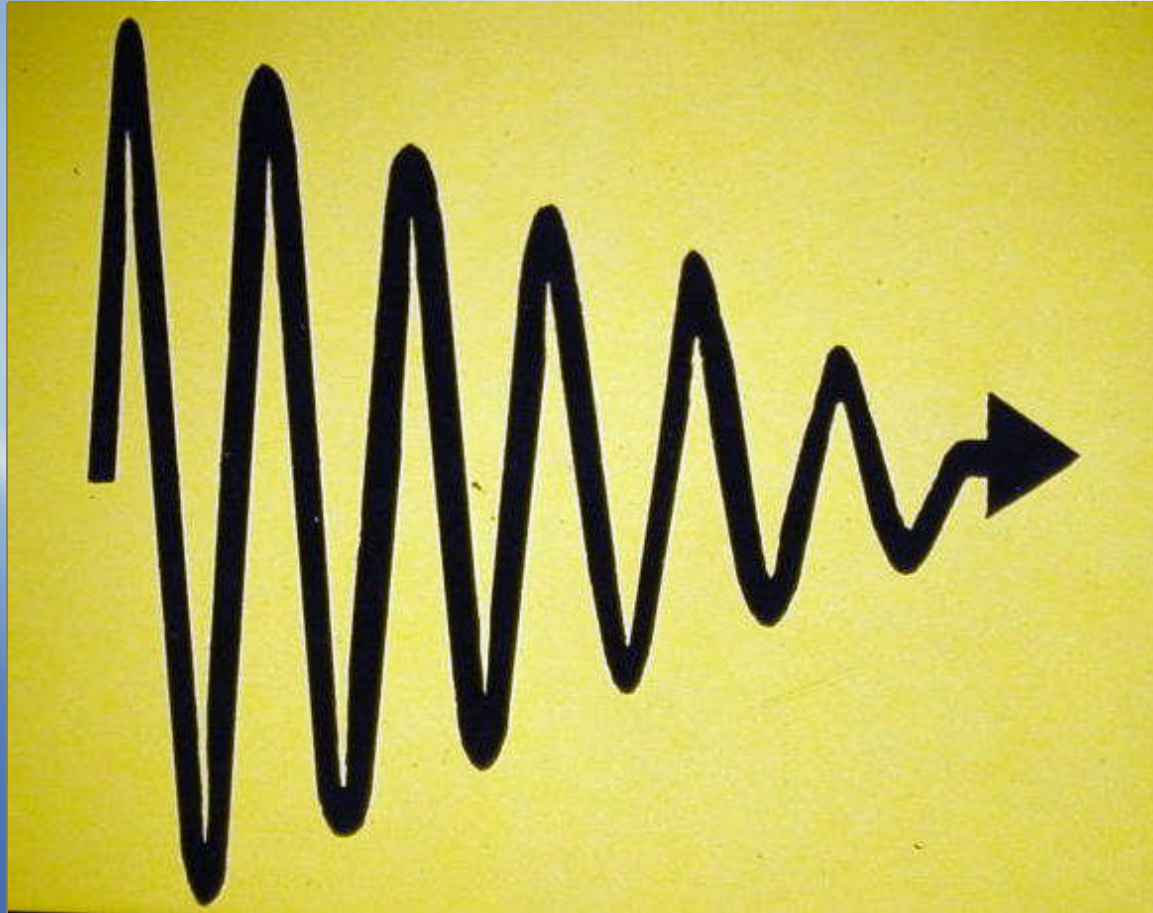
Tablet delivery device for testing esophageal irritancy in the dog



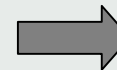
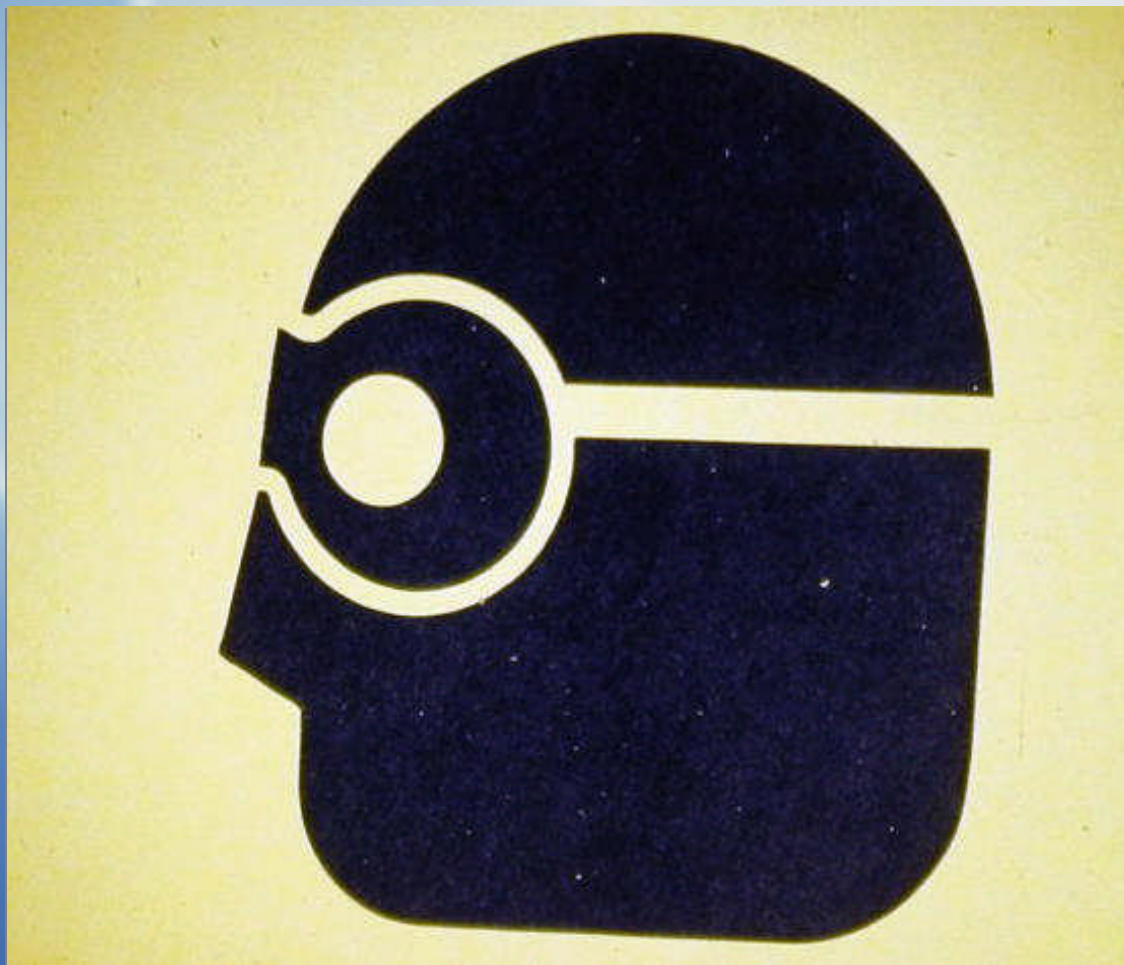
Nuclear transfer in the rat



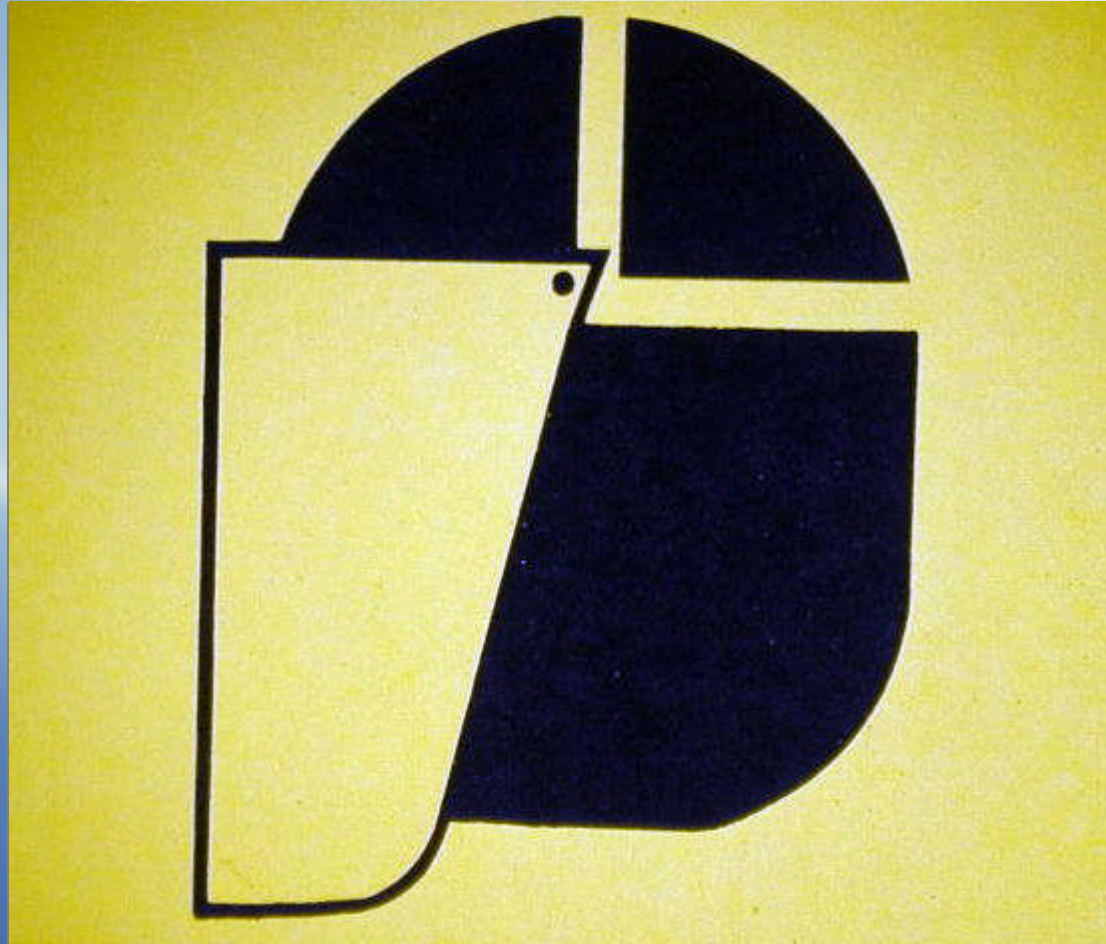
Ultraviolet light



Safety glasses required



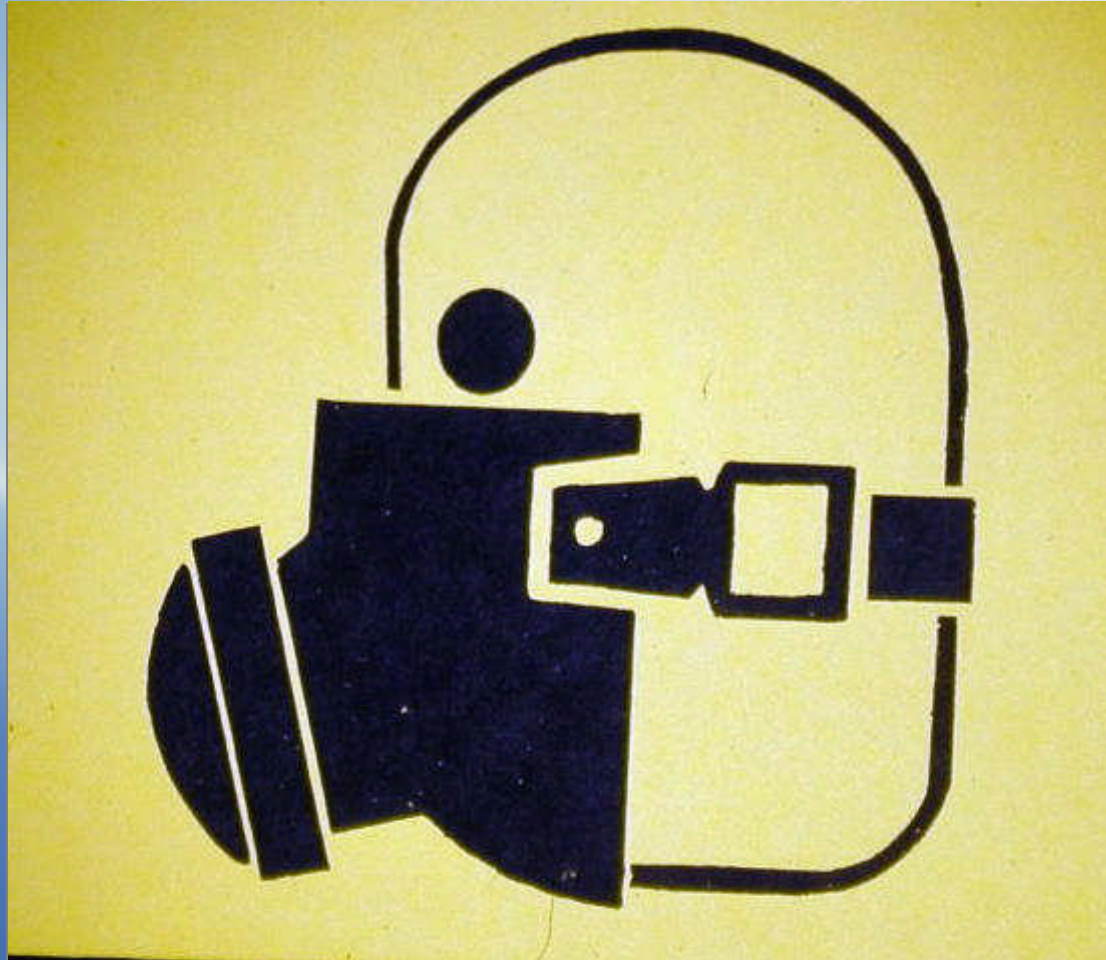
Face protection required



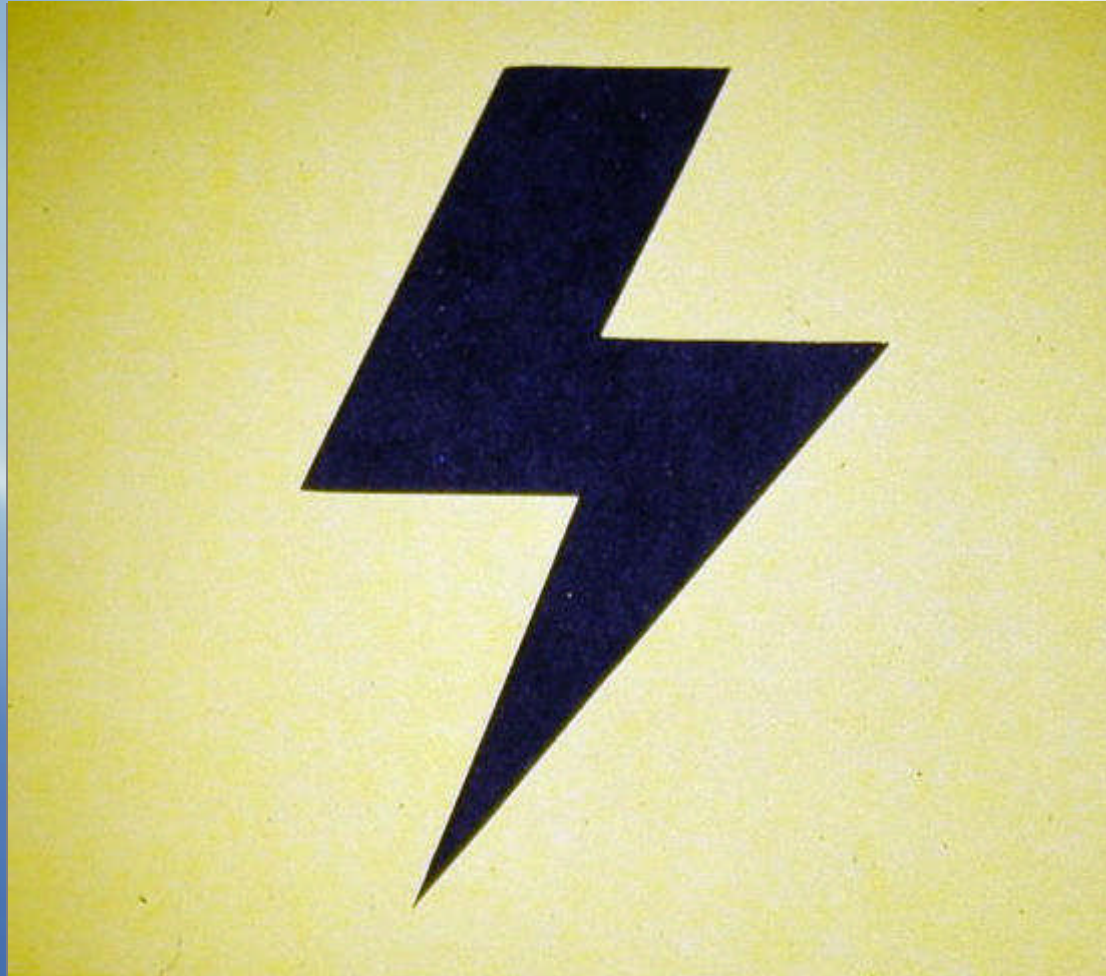
Electrical hazard



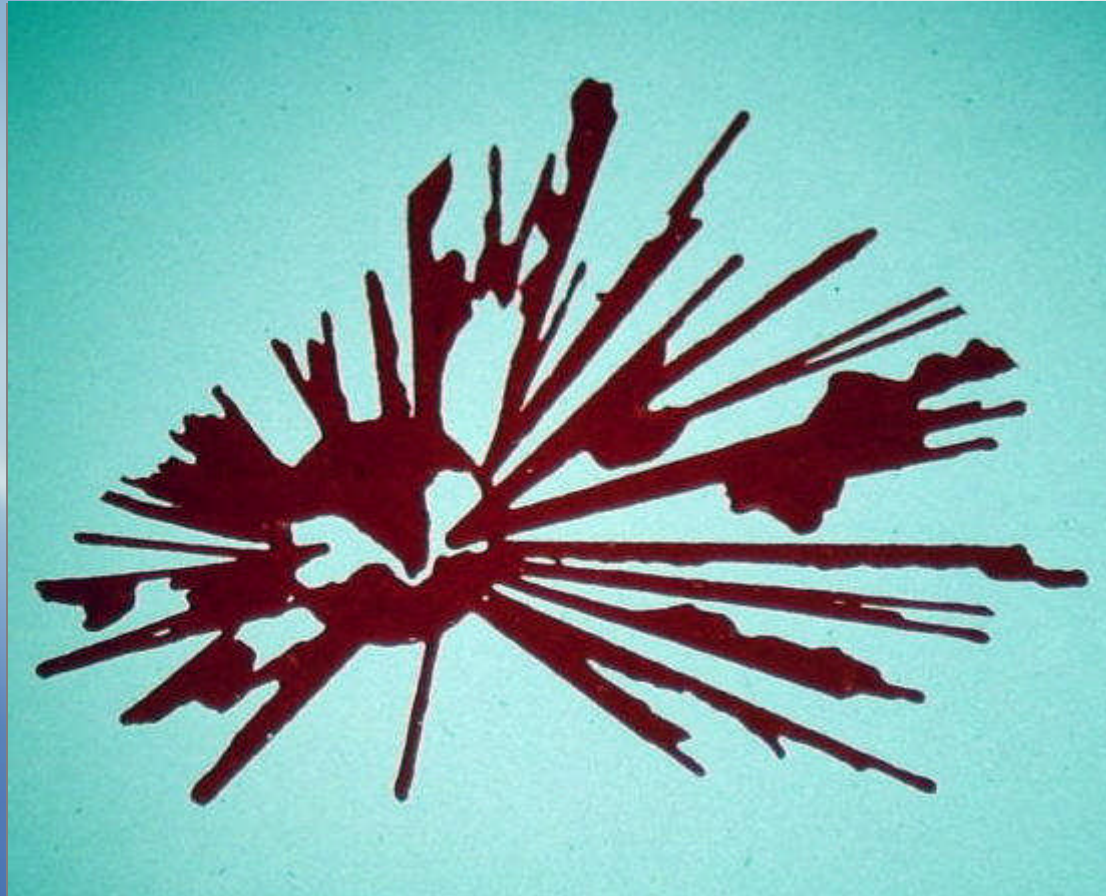
Respirator required



High voltage



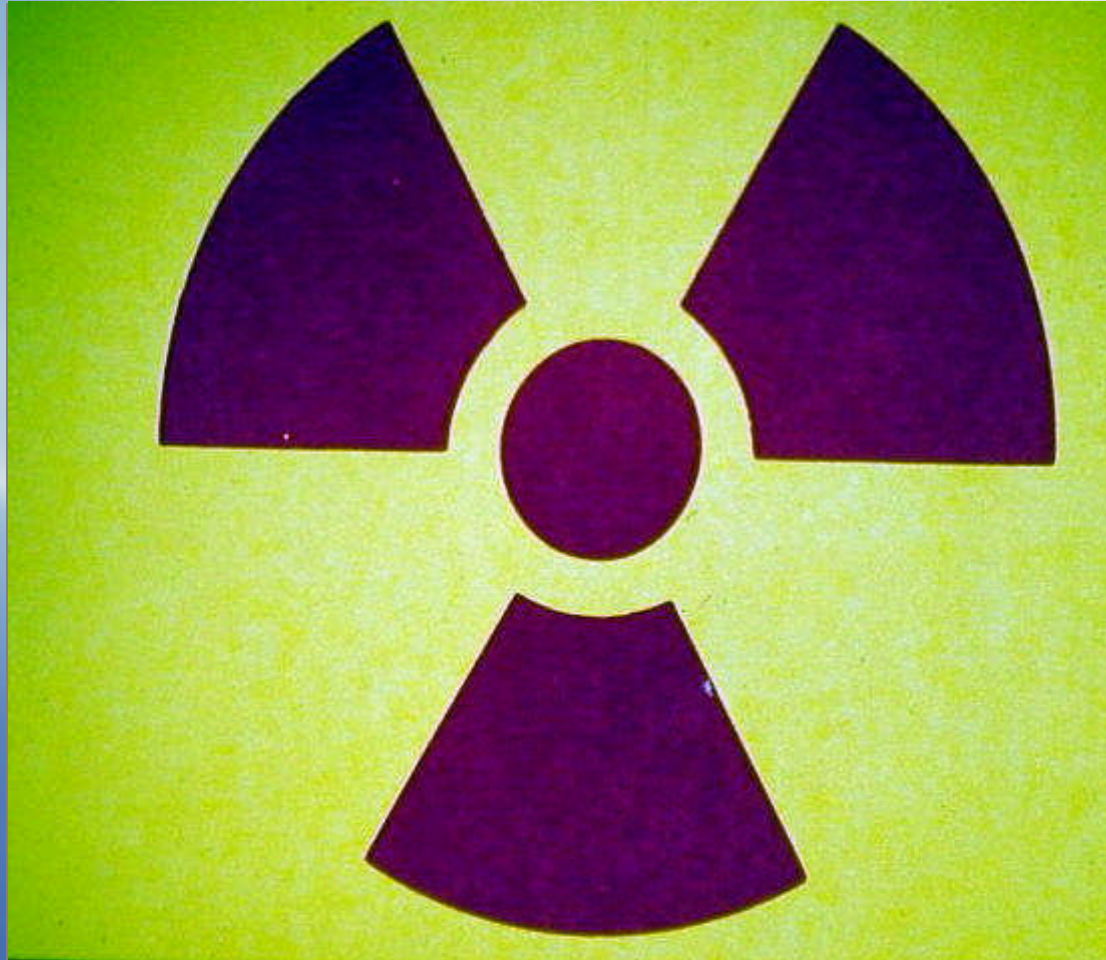
Explosive



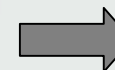
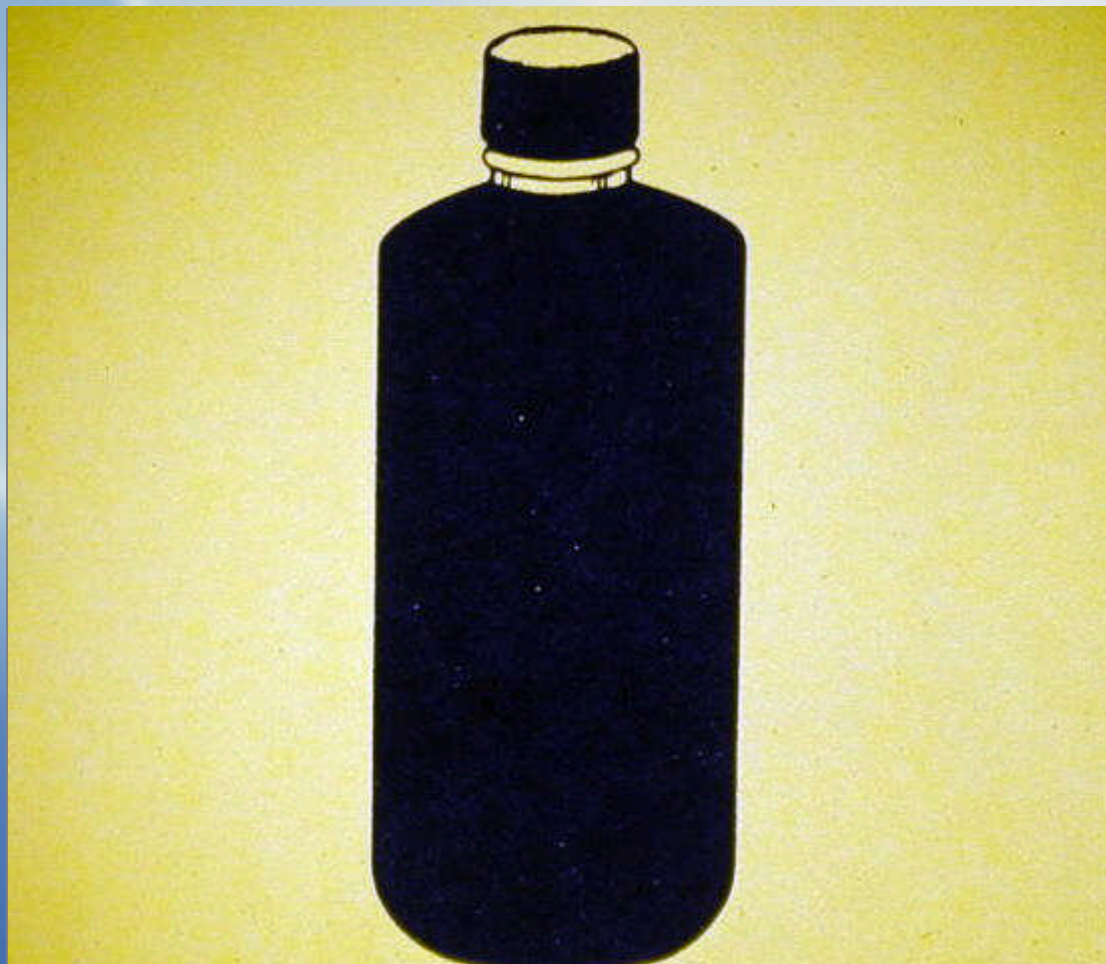
Toxic gas



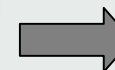
Radioactive material



Chemical Storage area



Corrosive Materials



Microwave radiation



Flammable solvents



Laminar flow cabinet



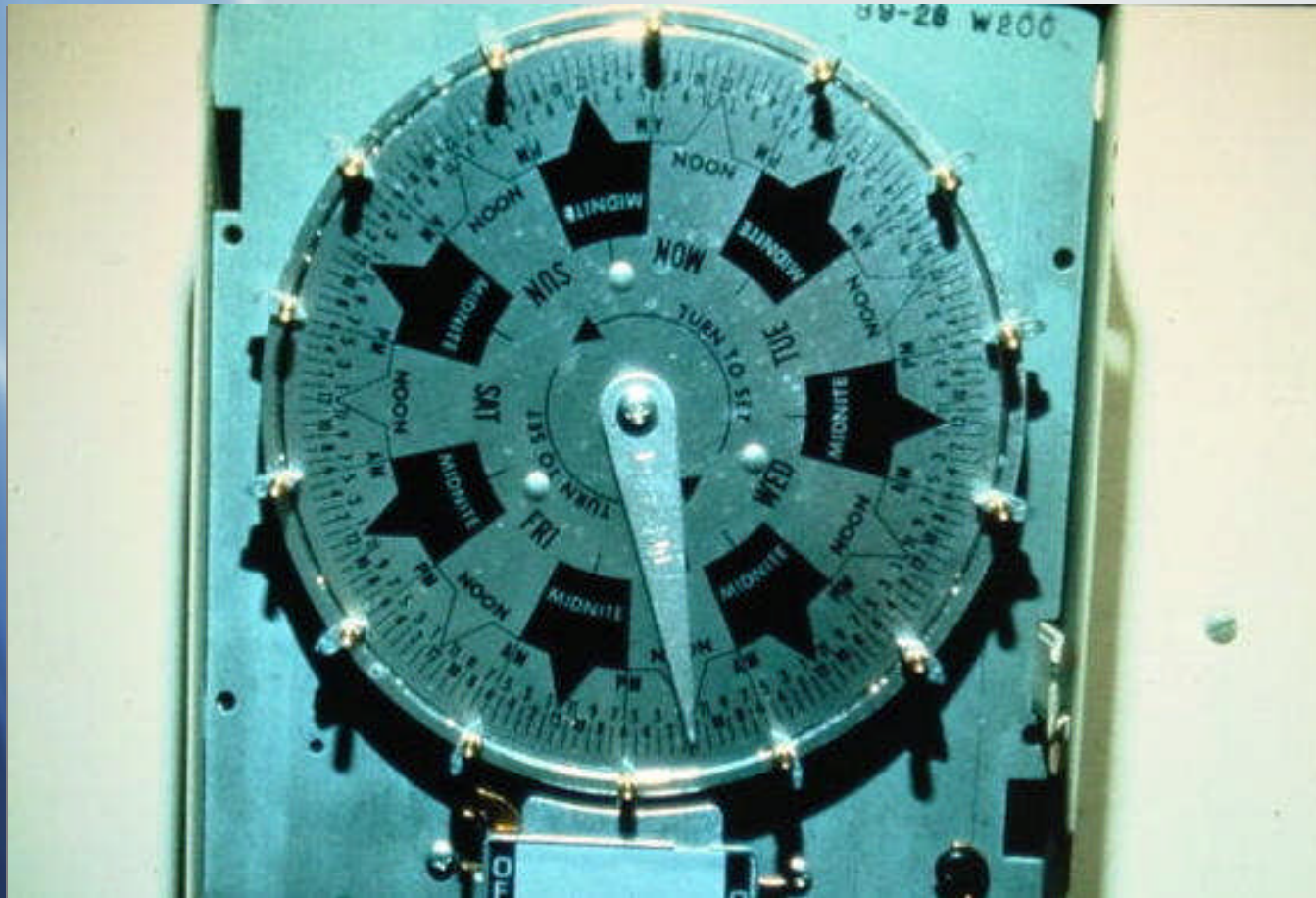
Rodent weight sorter



Biosafety needle disposal



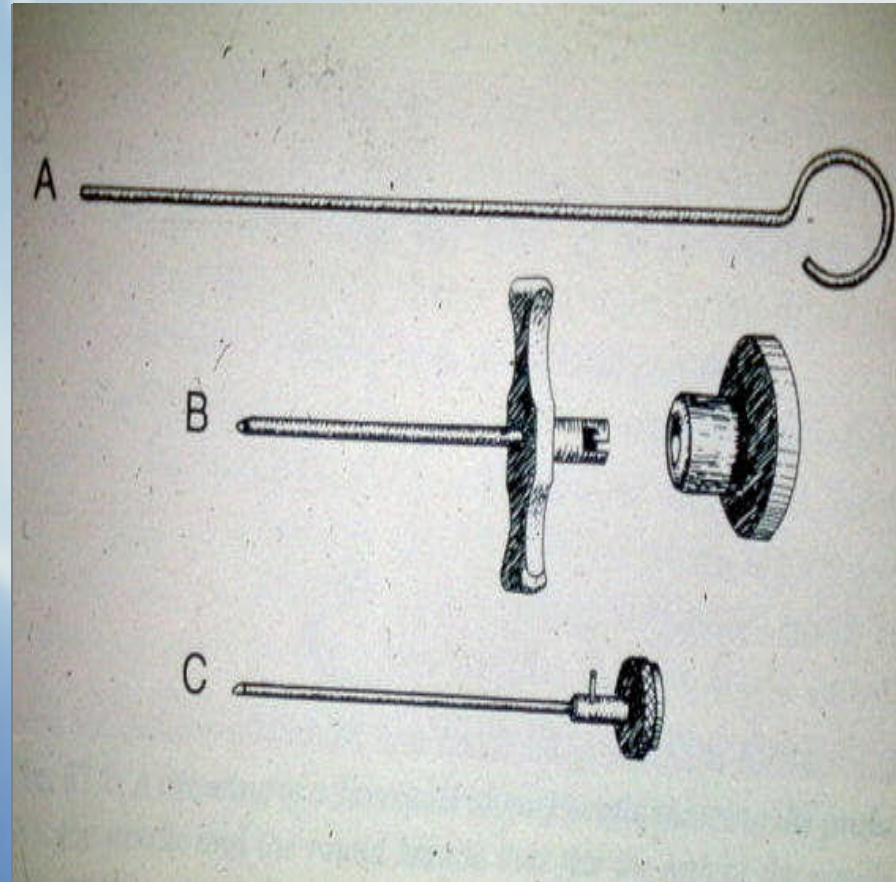
Light timer



Jamshidi needle

Bone marrow core biopsy

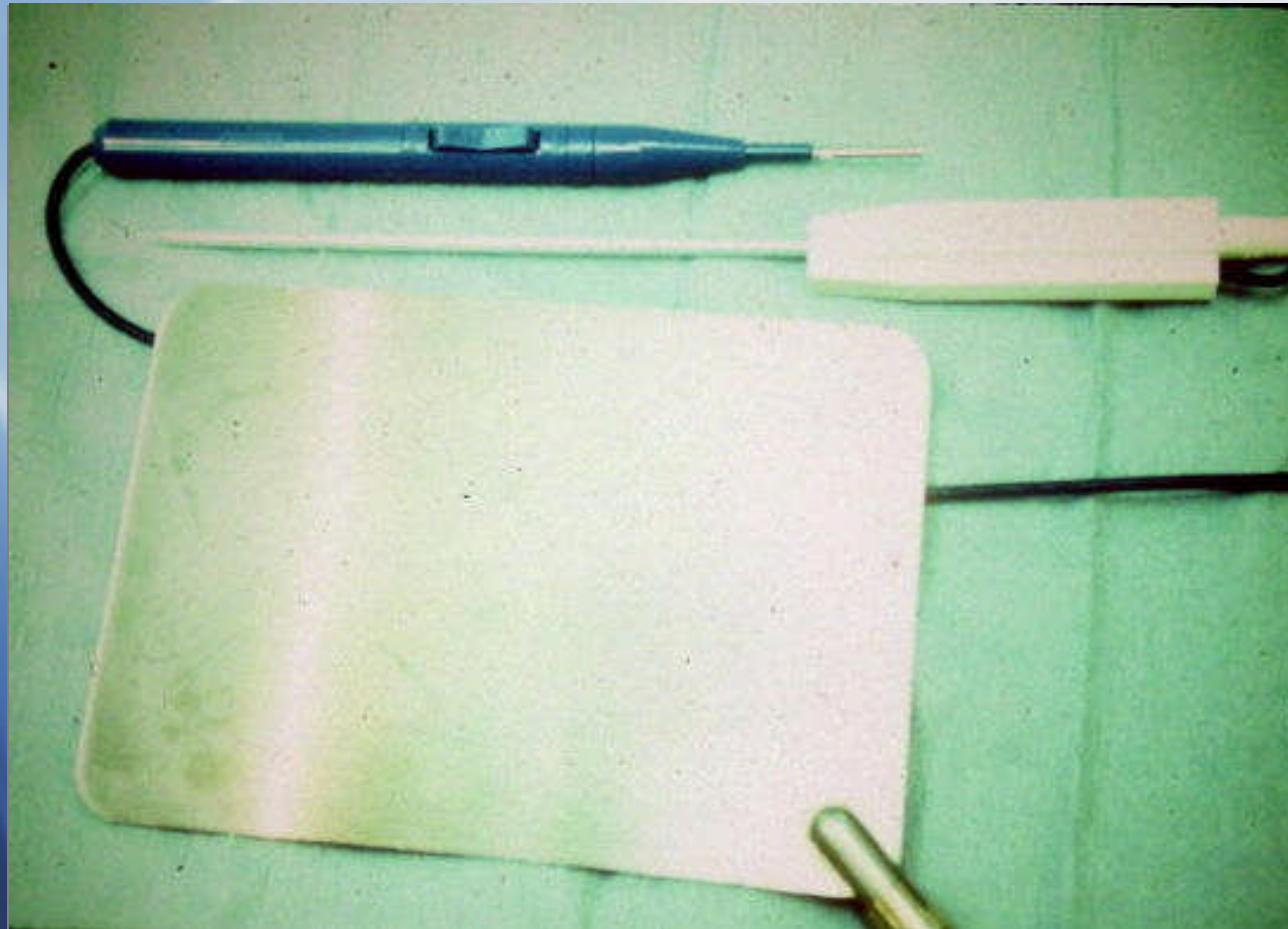
- A. Probe
- B. Needle
- C. stylet



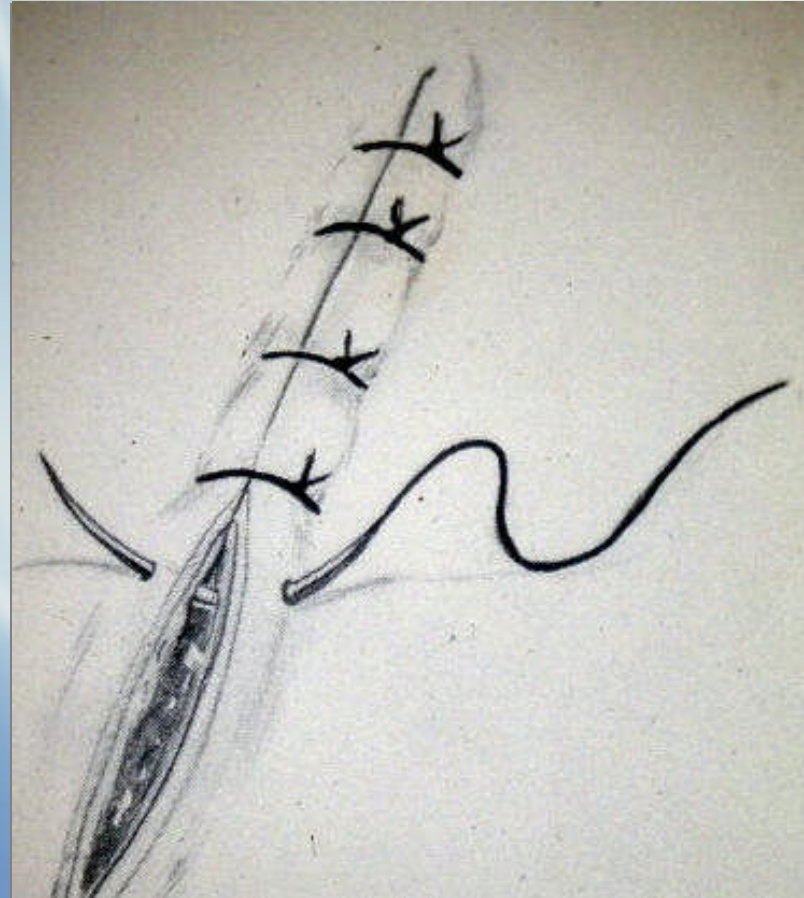
Snake hooks and tongs



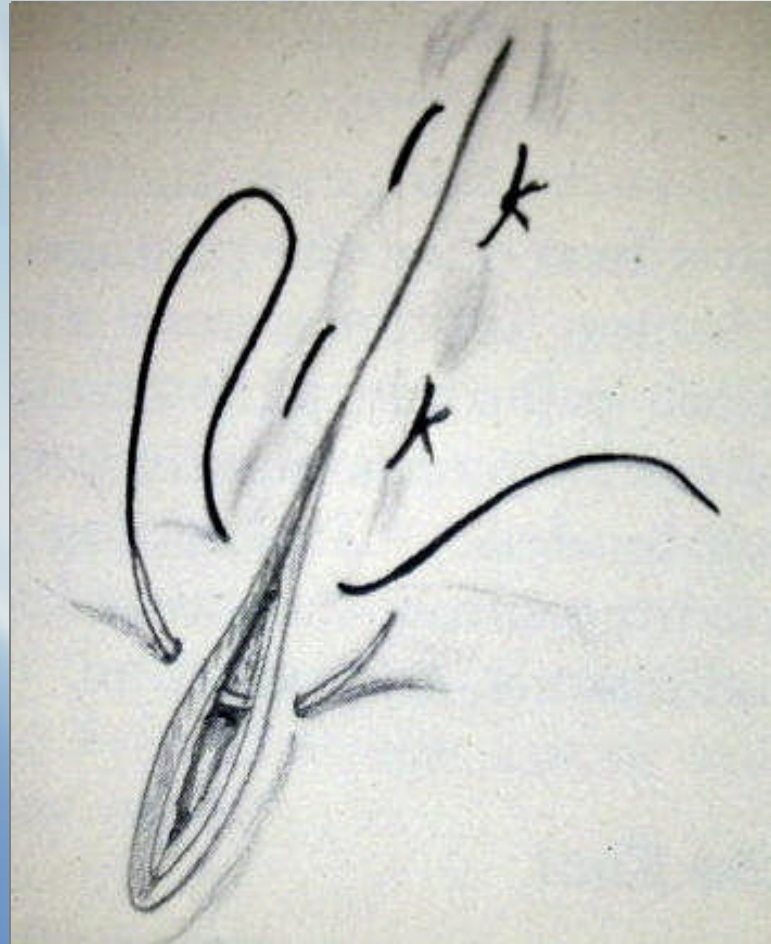
Electrocautery unit



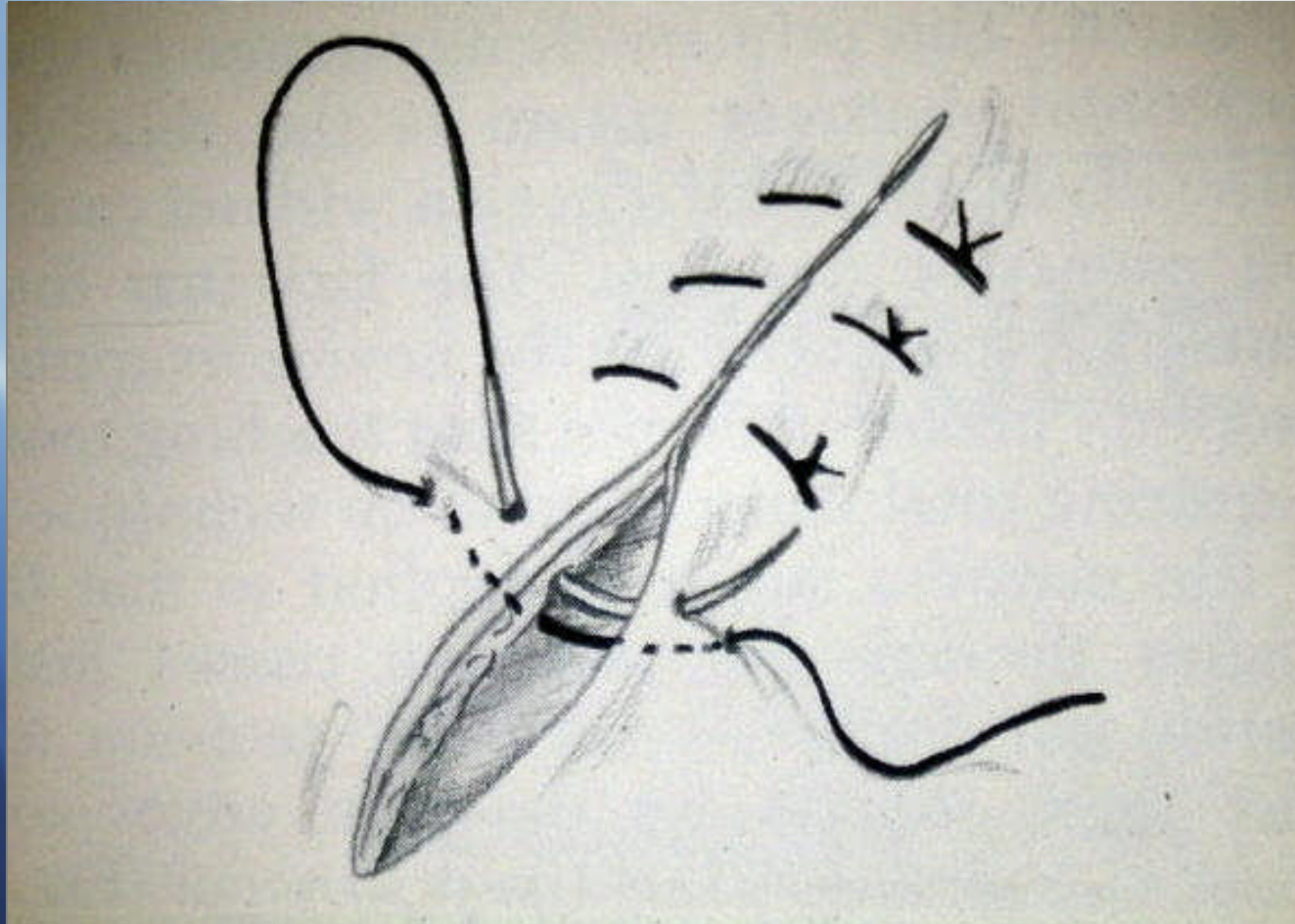
Simple interrupted



Horizontal mattress

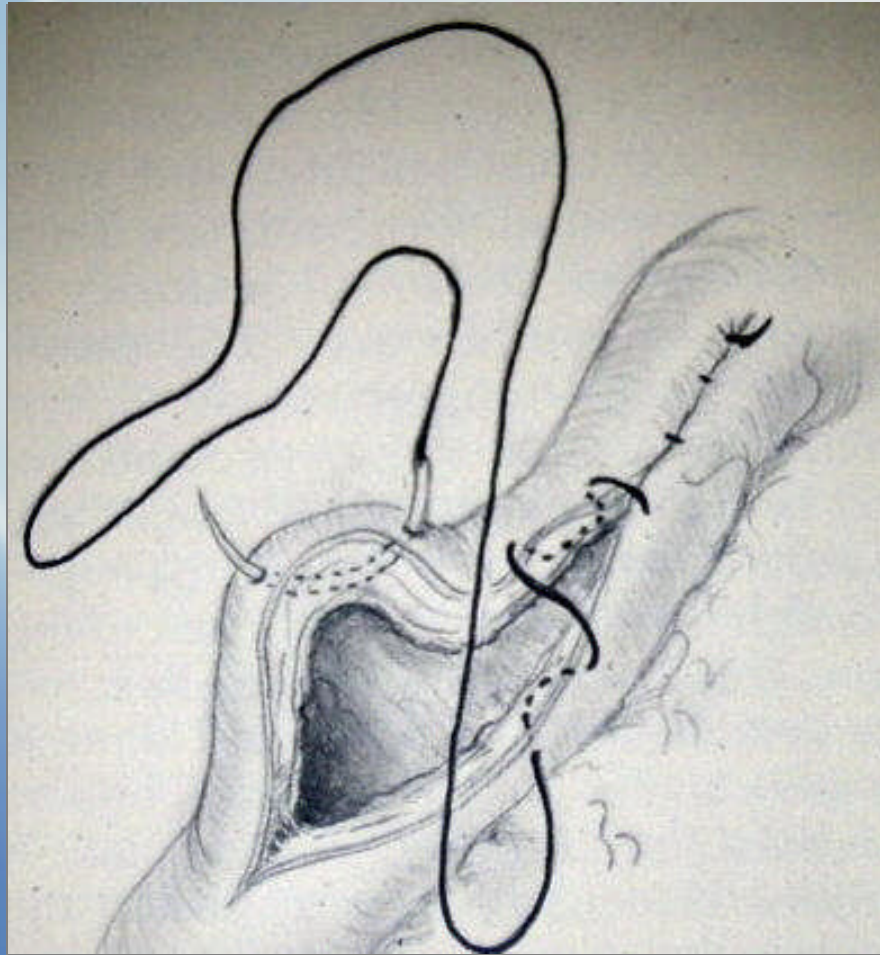


Tension suture vertical mattress



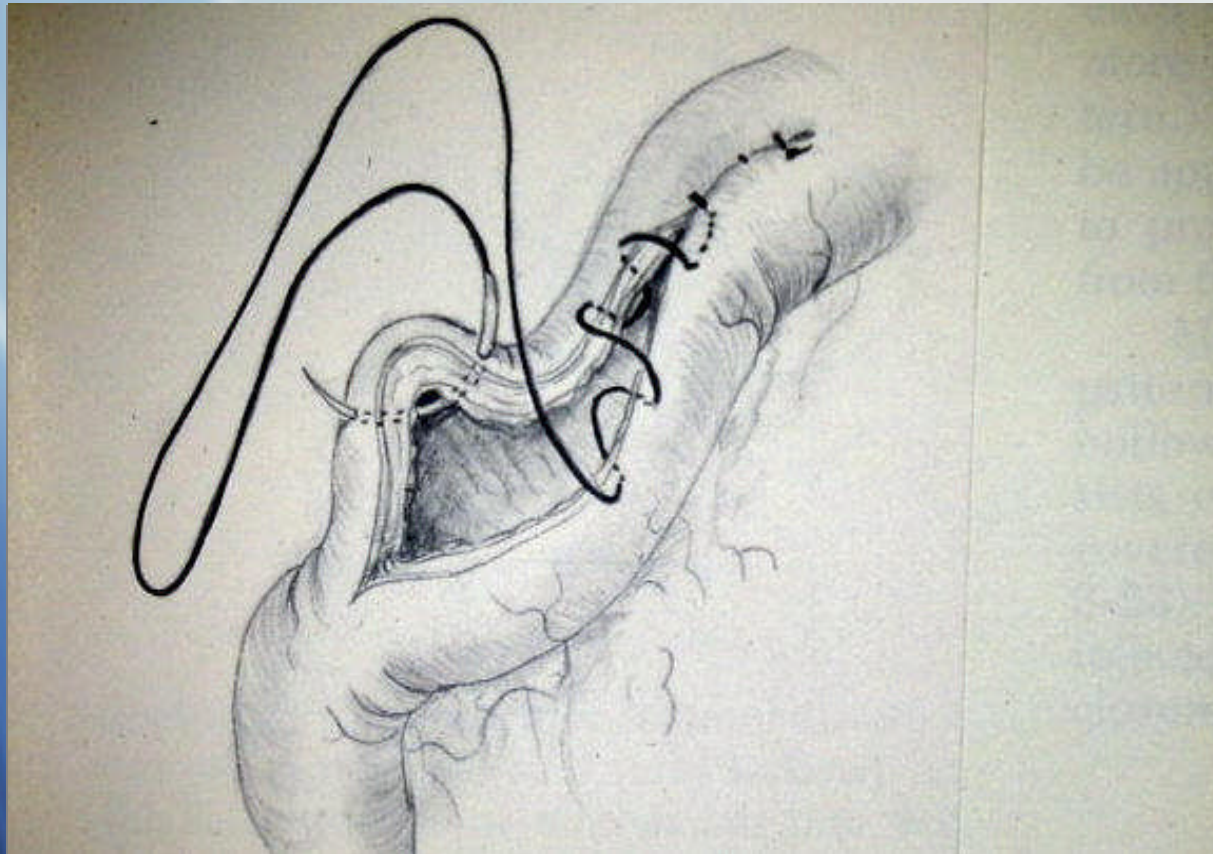
Cushing

Inverting continuous horizontal mattress



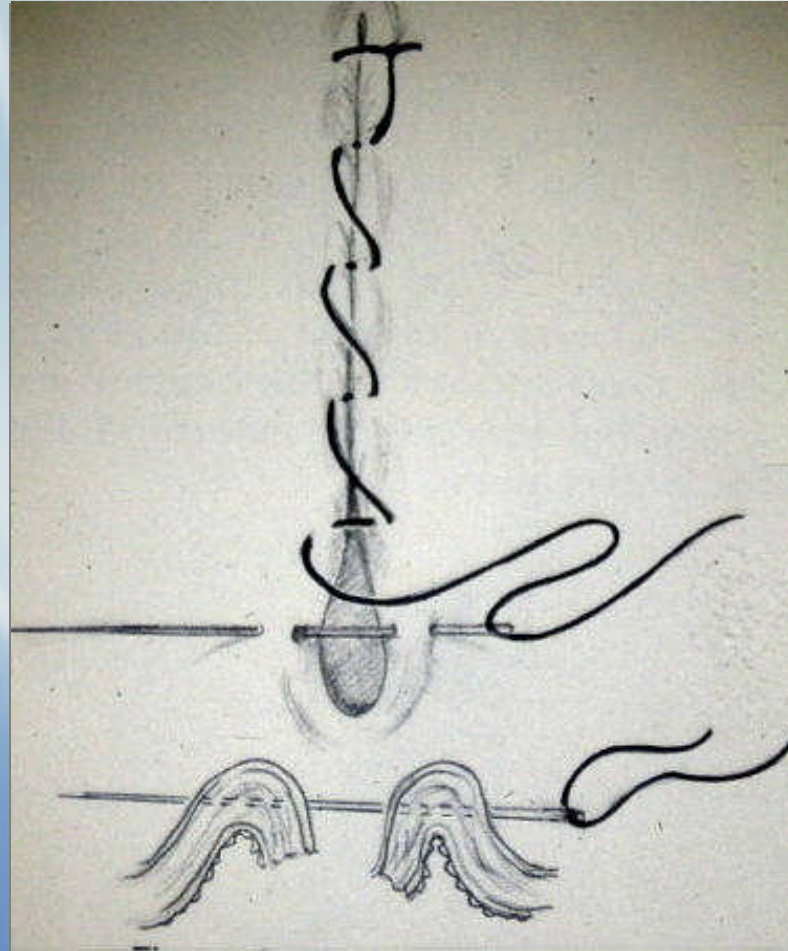
Connell

Inverting continuous horizontal mattress



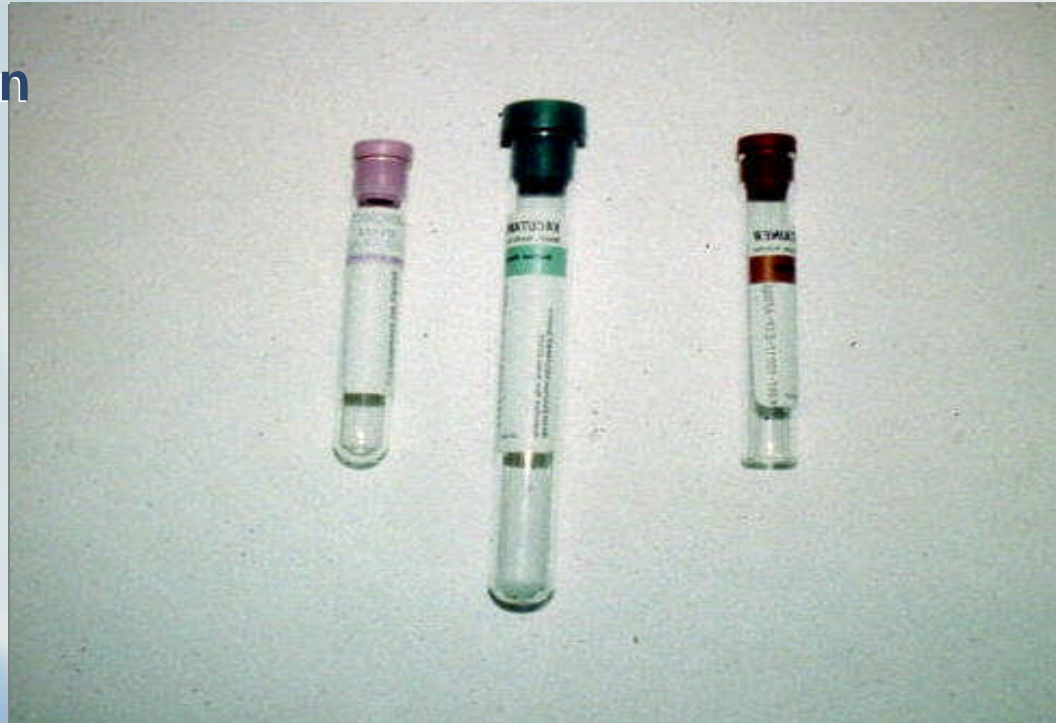
Lembert

Inverting continuous vertical mattress



Blood sample tubes

- Purple = EDTA
- Green = heparin
- Red = plain



Pup with PE 10 gastrostomy tube



Pup in a cup

Artificial rearing technique



Schroeder-Thomas Splint *for fractured humerus*



***Figure 8 Ehmer sling
post reduction fixation coxofemoral
luxation***



Robert Jones bandage



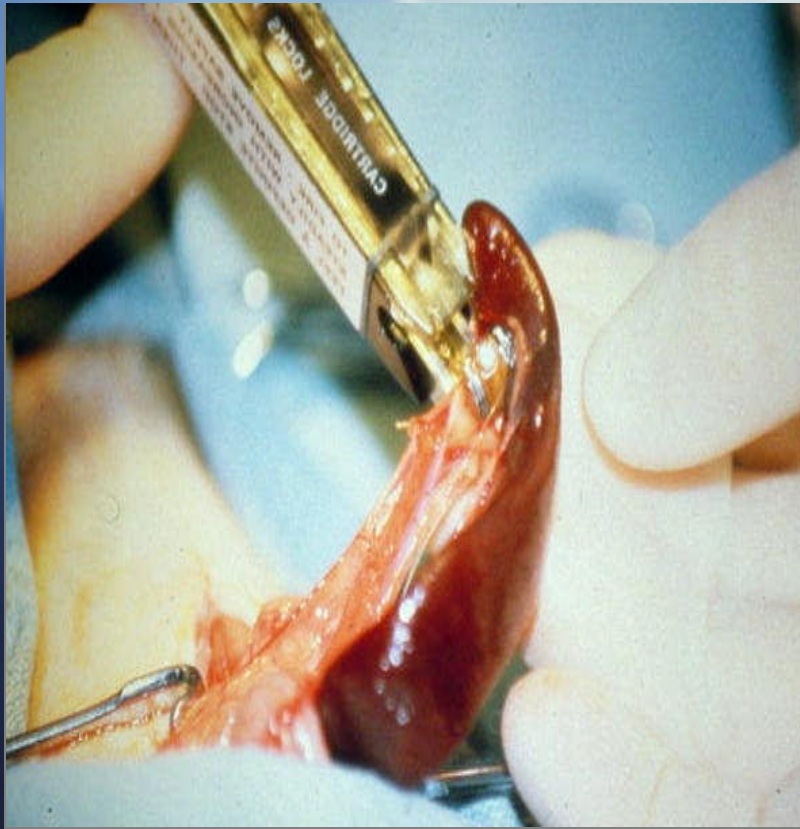
O₂, N₂O, N₂, CO₂



Yucatan miniature swine restraint



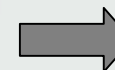
Stapling devices



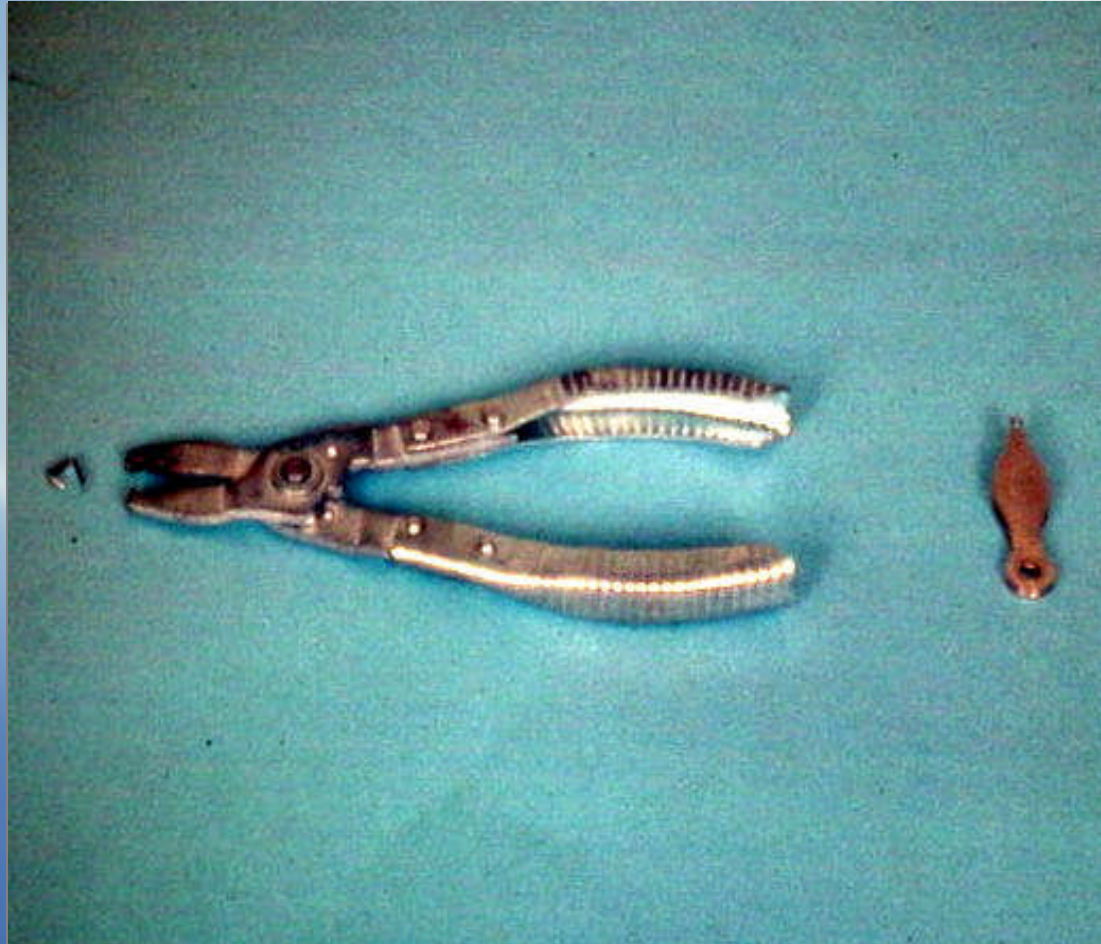
External defibrillation paddles



Farrowing crate



Rodent ear tag and applicator rodent ear punch



Russell and Birch



Maze system to enrich marmosets



Maze puzzle for marshmallow treat



Collar for ID of Marmoset



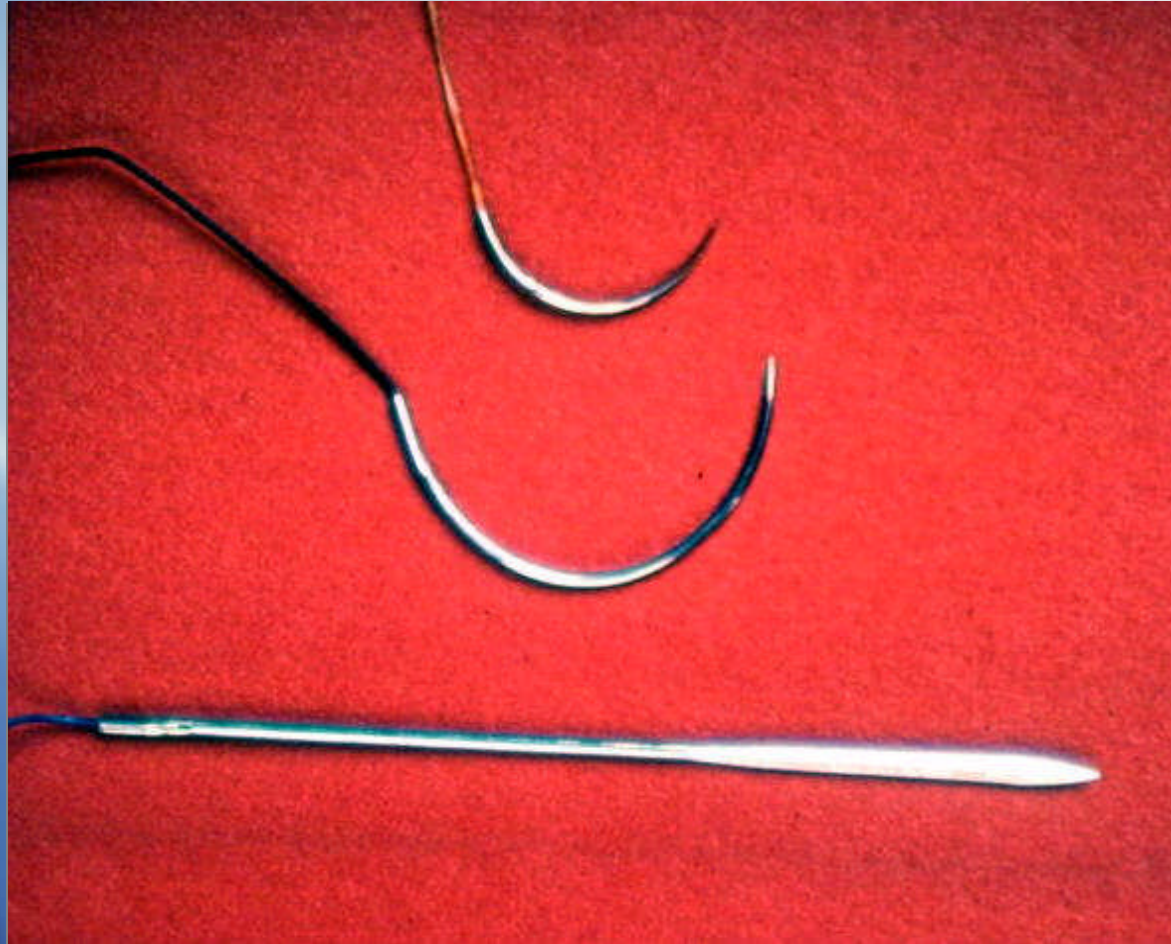
Marmoset with identification collar



Marmoset nest box

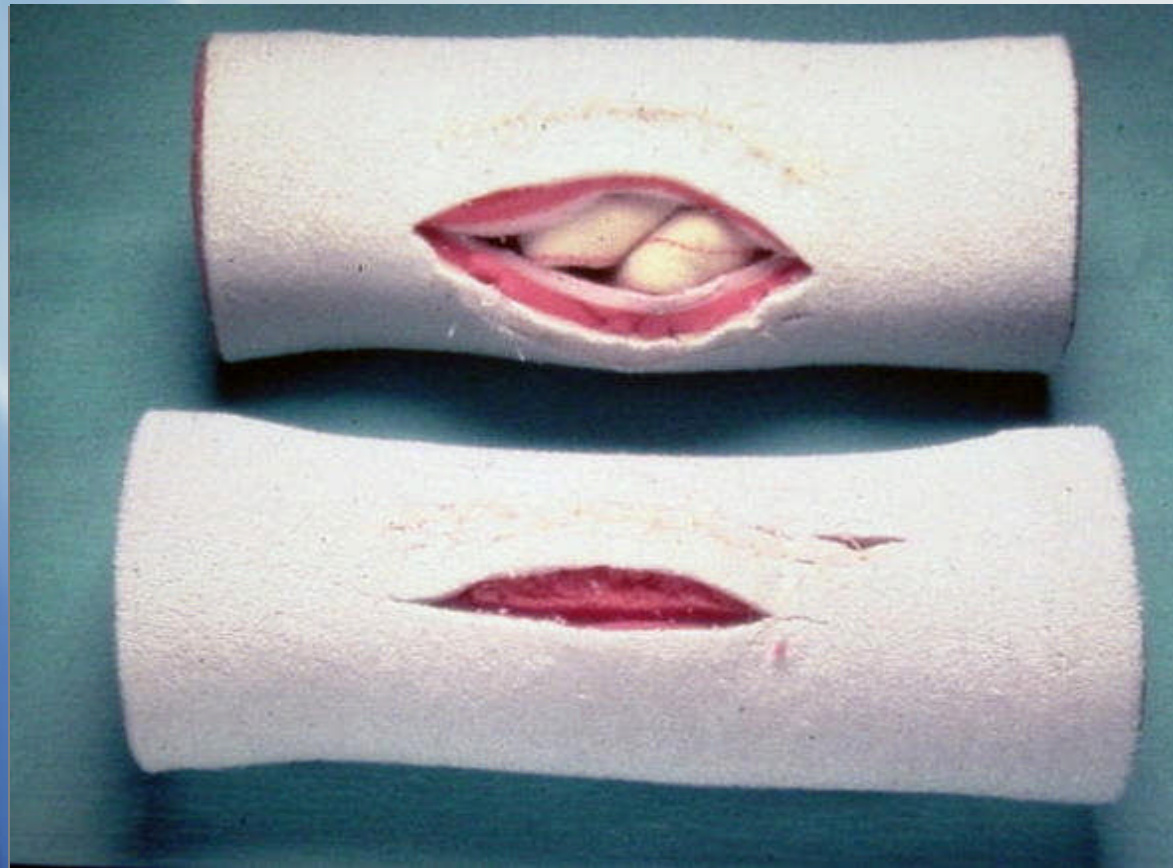


Suture needles

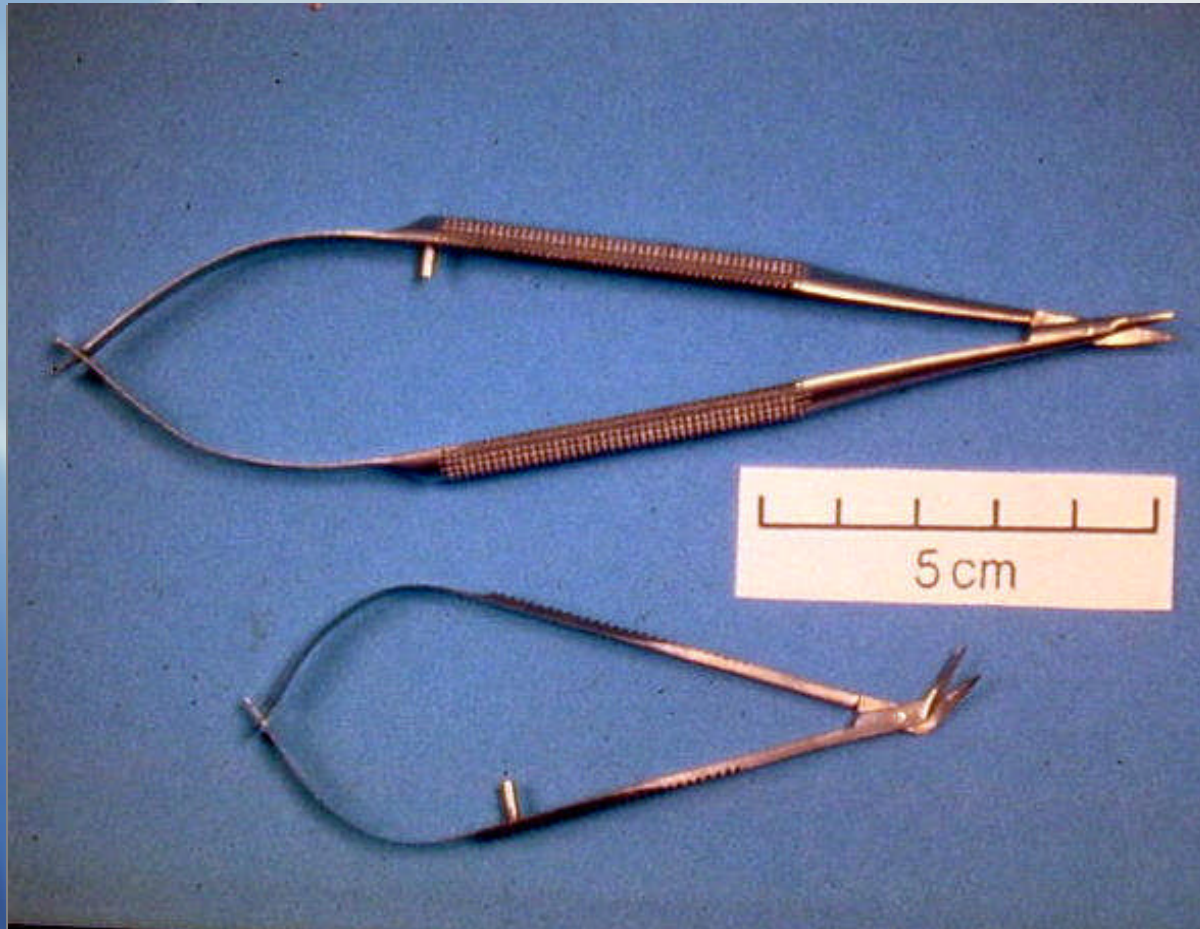


DAISIE

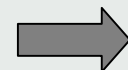
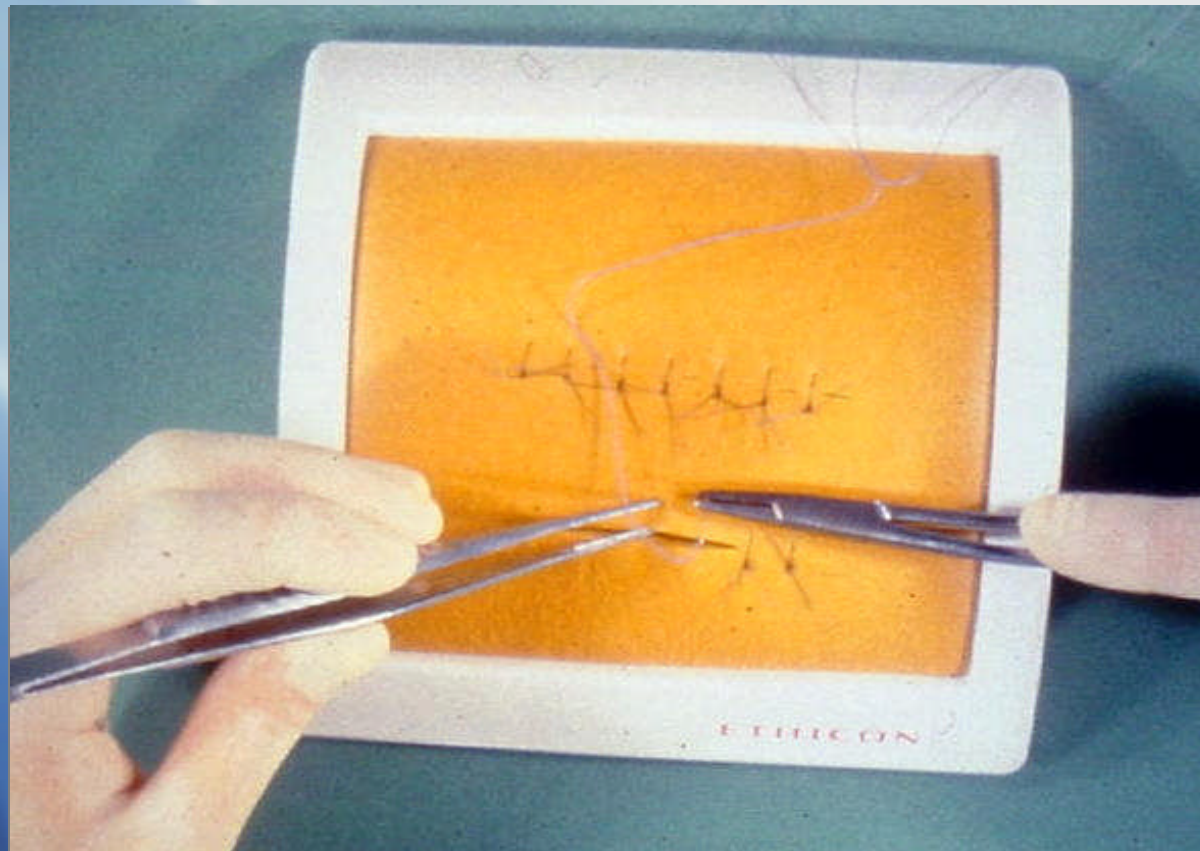
Dog abdomen simulator



Microvascular scissors

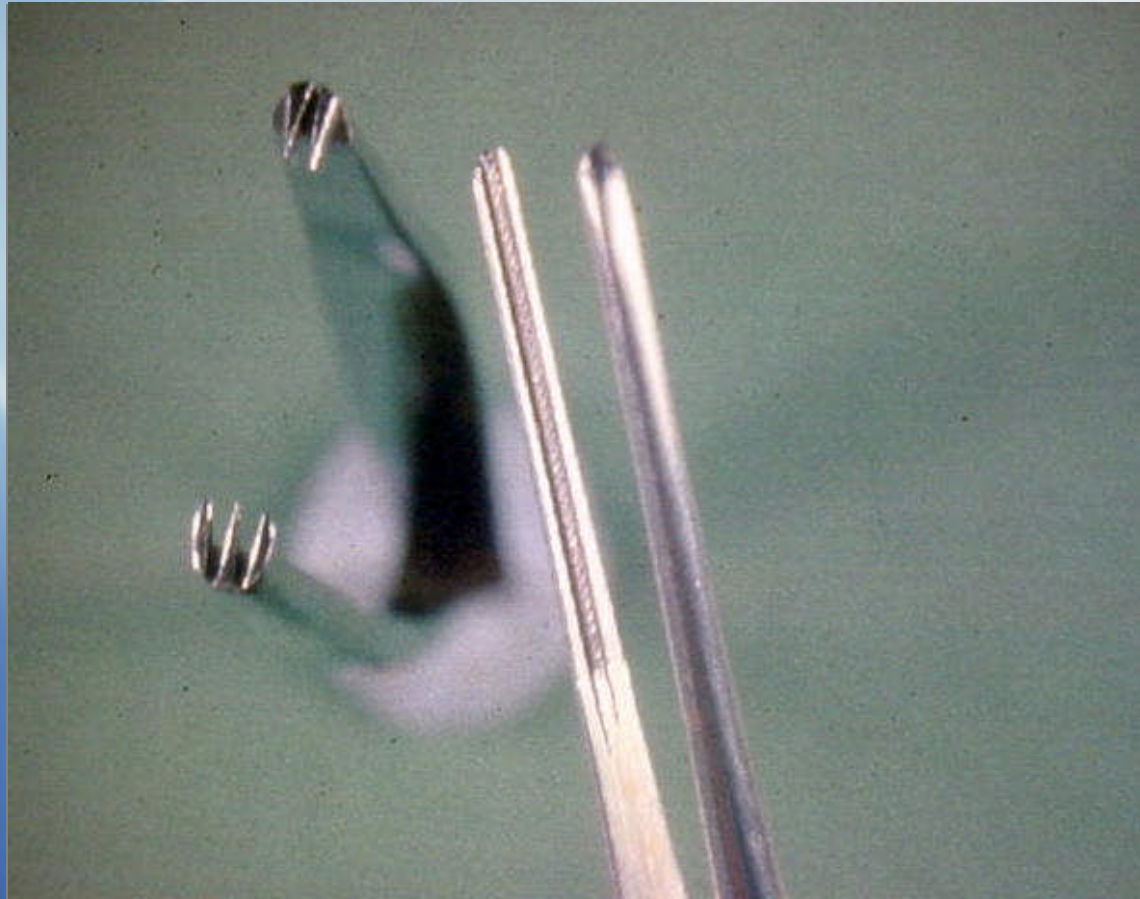


Placing sutures in practice block

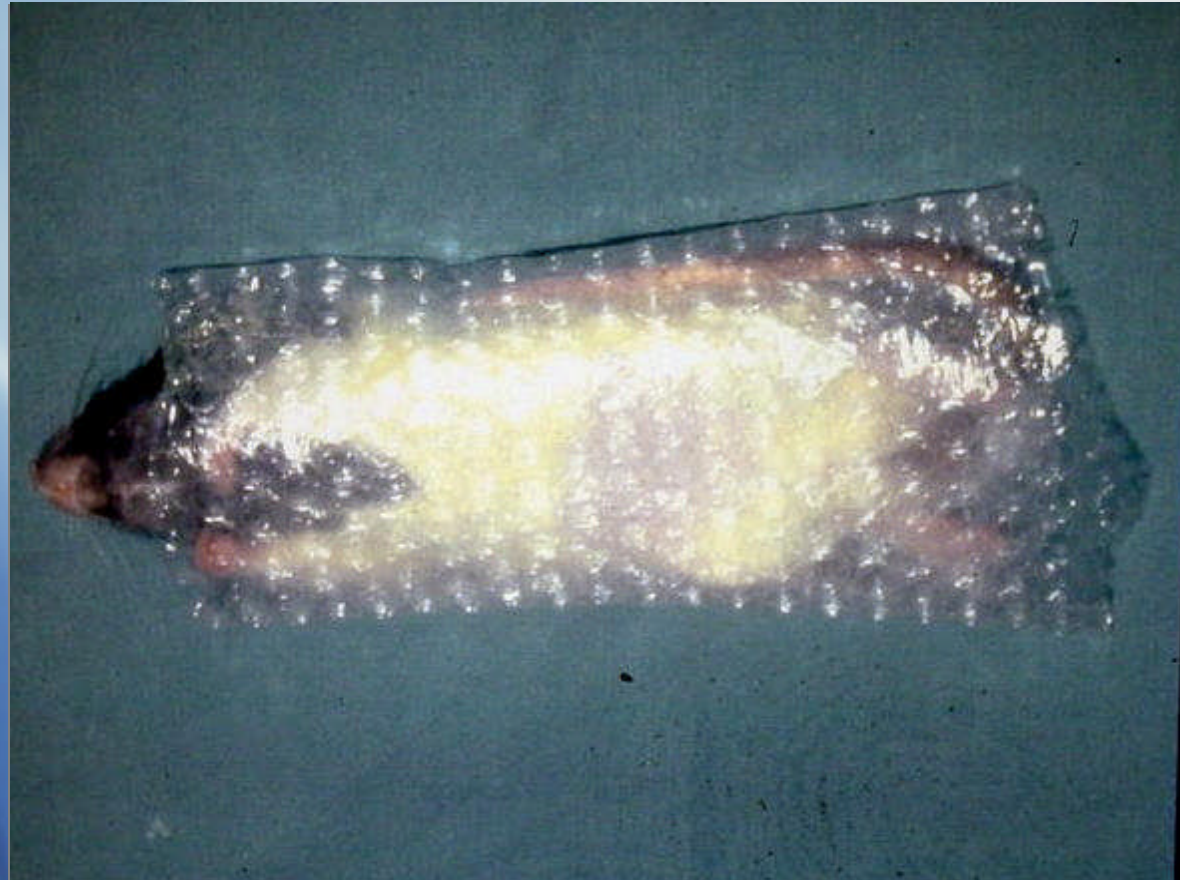


Rat tooth forceps

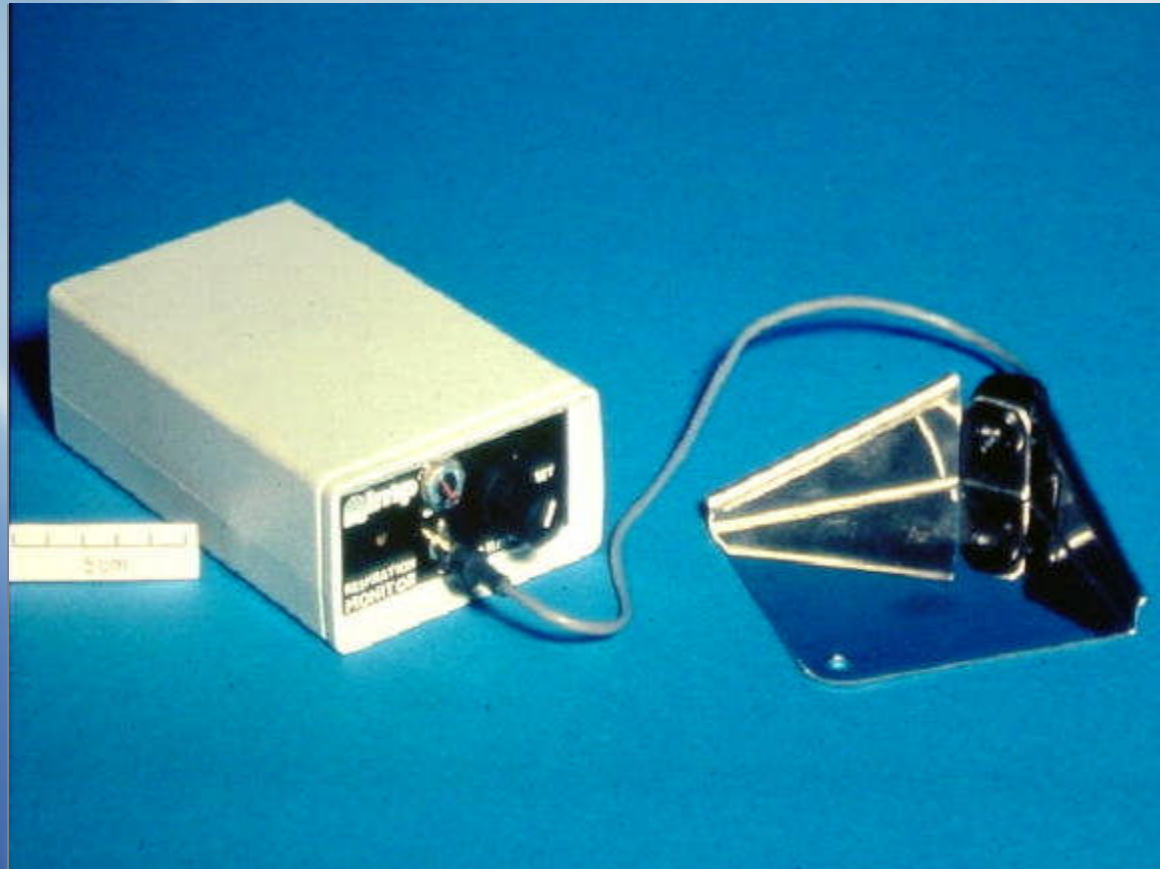
Debakey forceps



Rat wrapped in bubble wrap to prevent heat loss



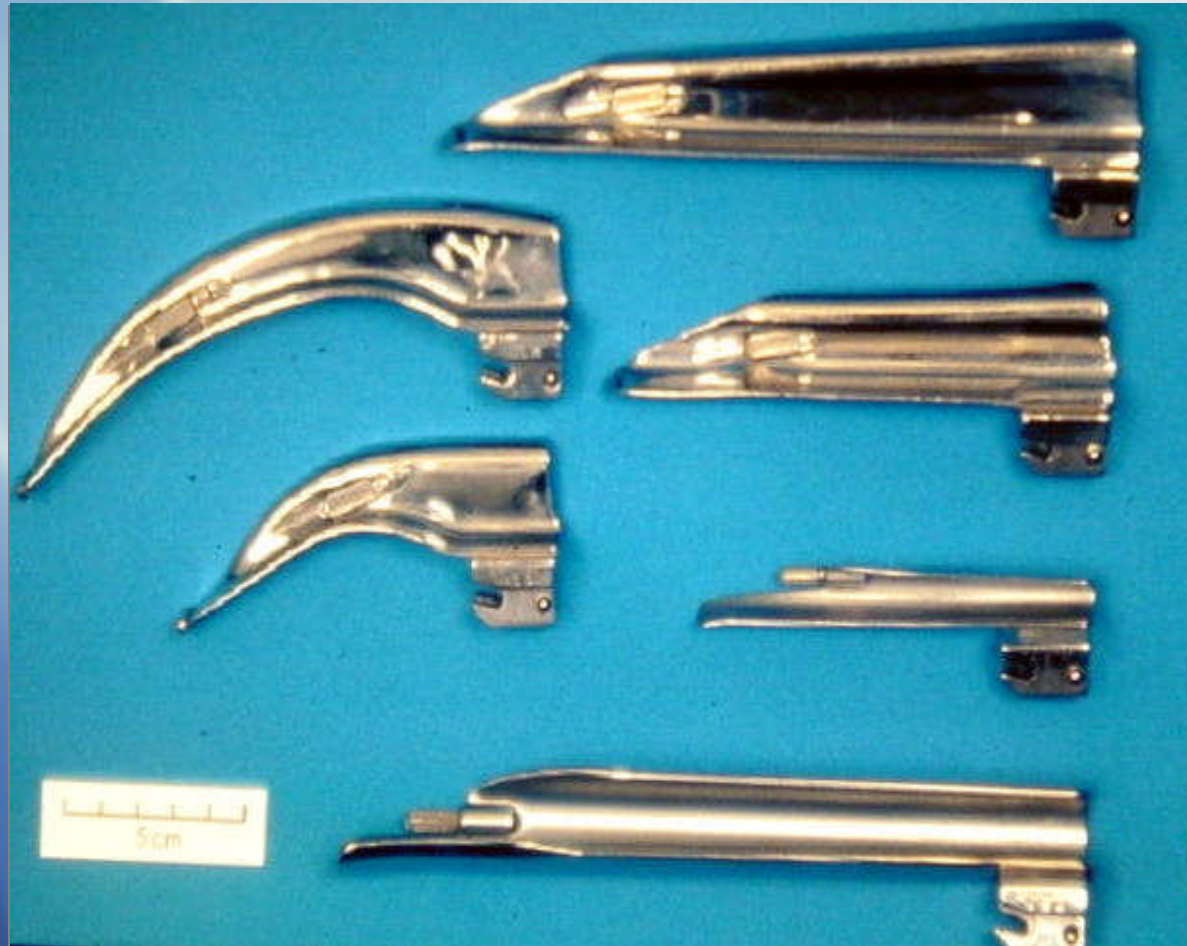
Respiratory monitor



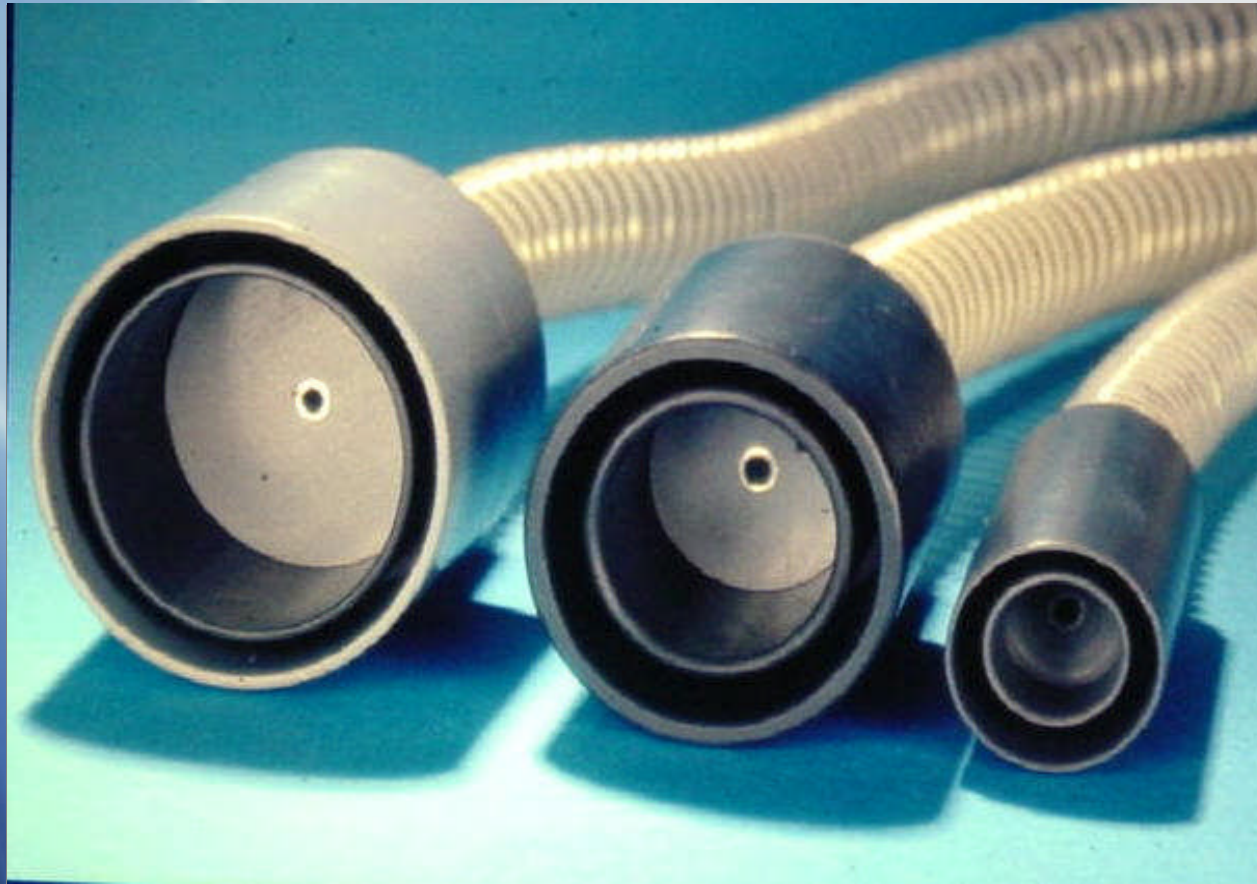
Isoflurane vaporizer



Assorted laryngoscope blades



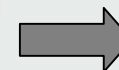
Concentric face mask system for gas scavenging



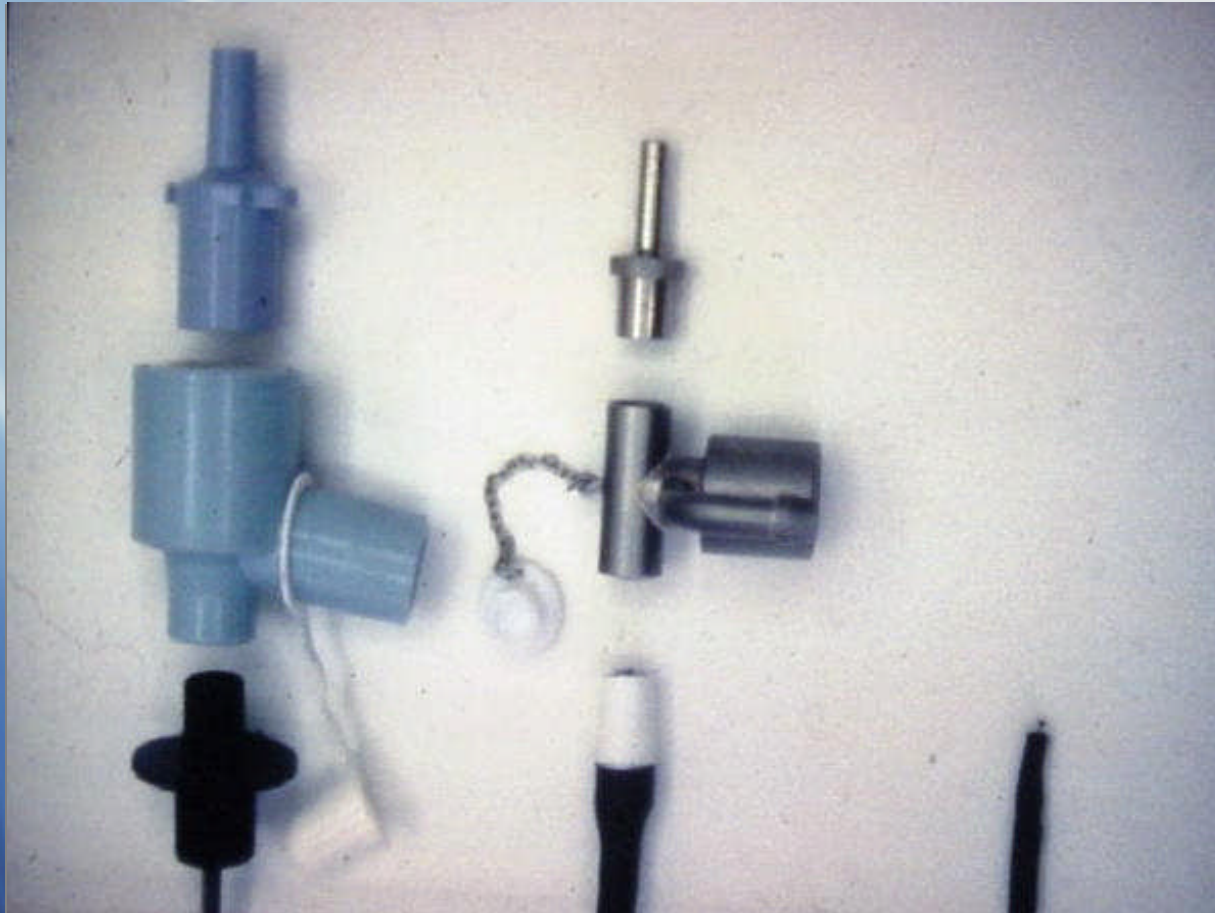
Rat connected to Silogic ECG monitor



Capture pistol with darts



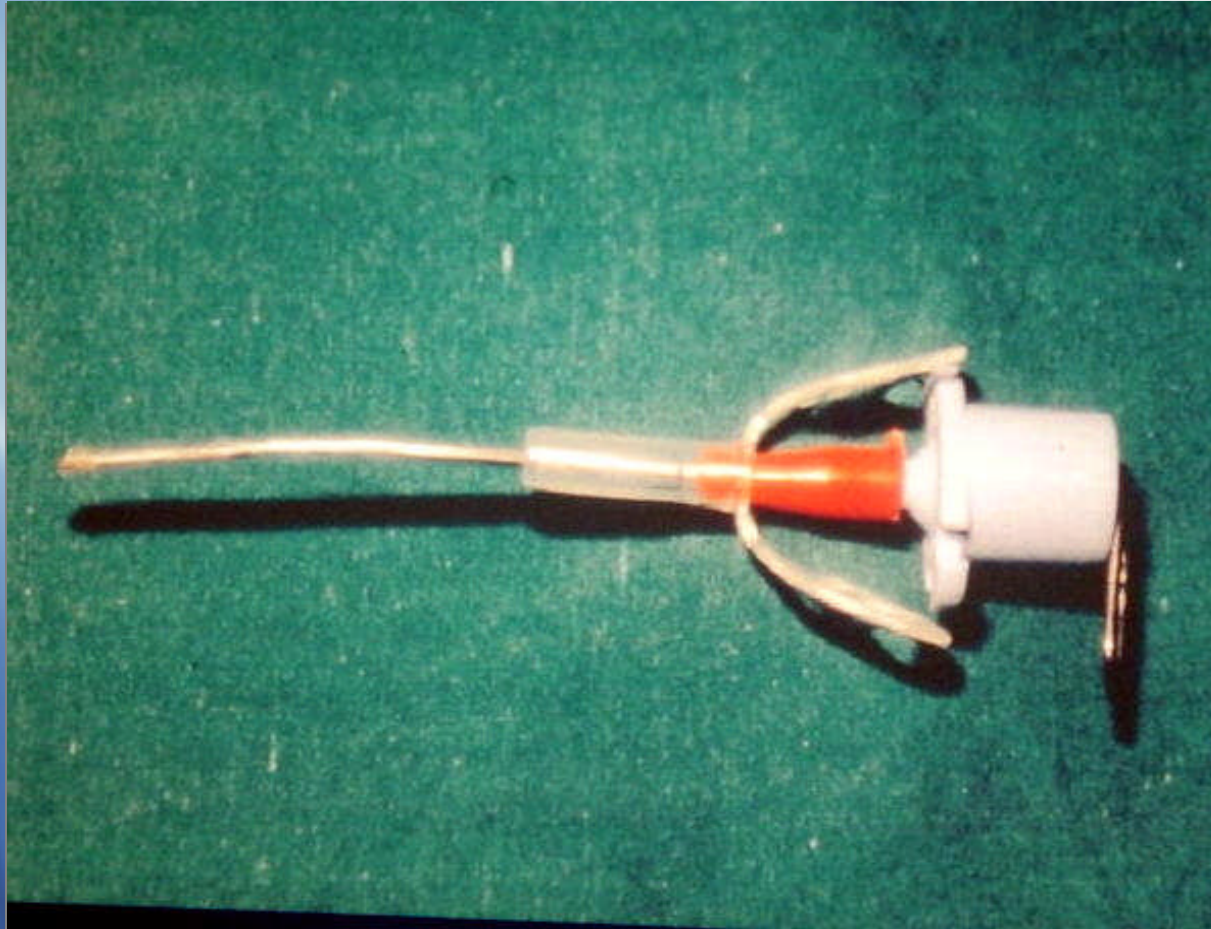
Endotracheal tube connectors



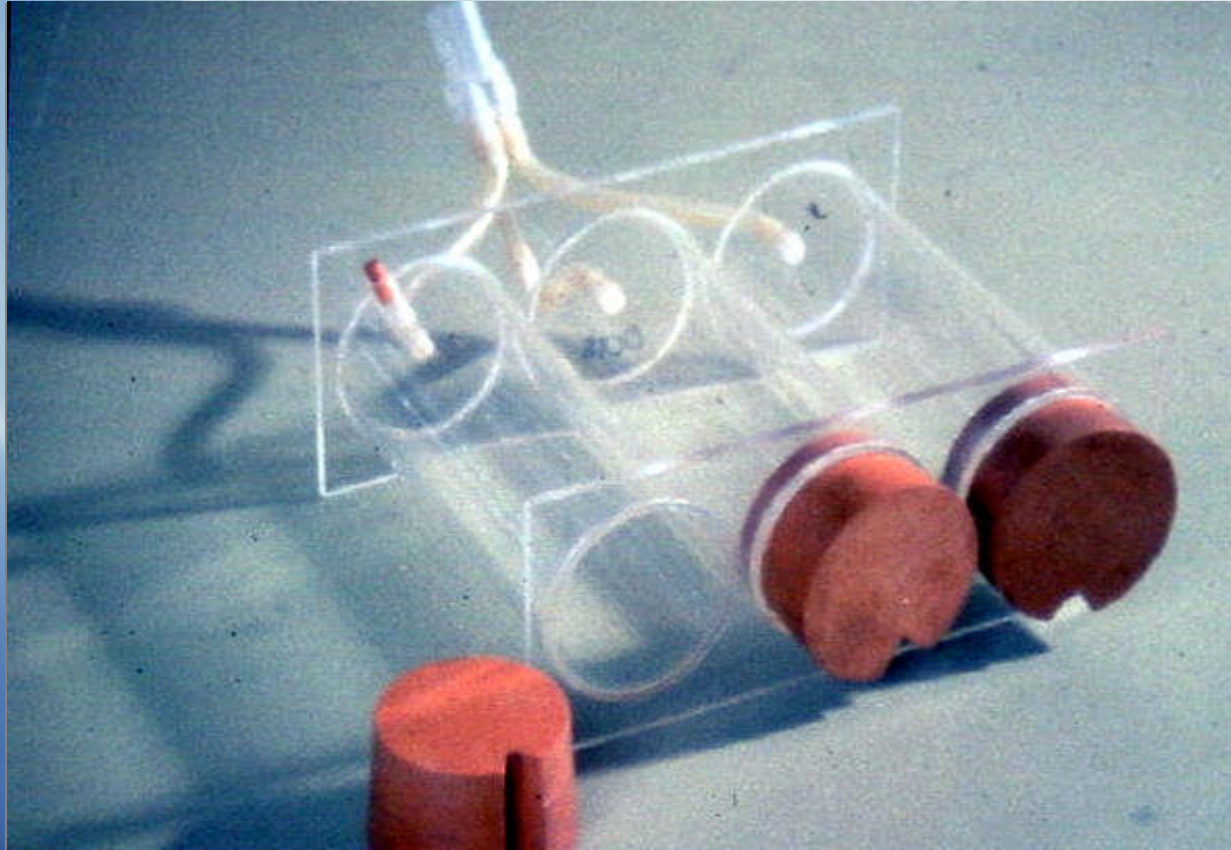
Hanging drop technique for collection of CSF



Rodent endotracheal tube with introducer



Anesthetic chambers for rodents

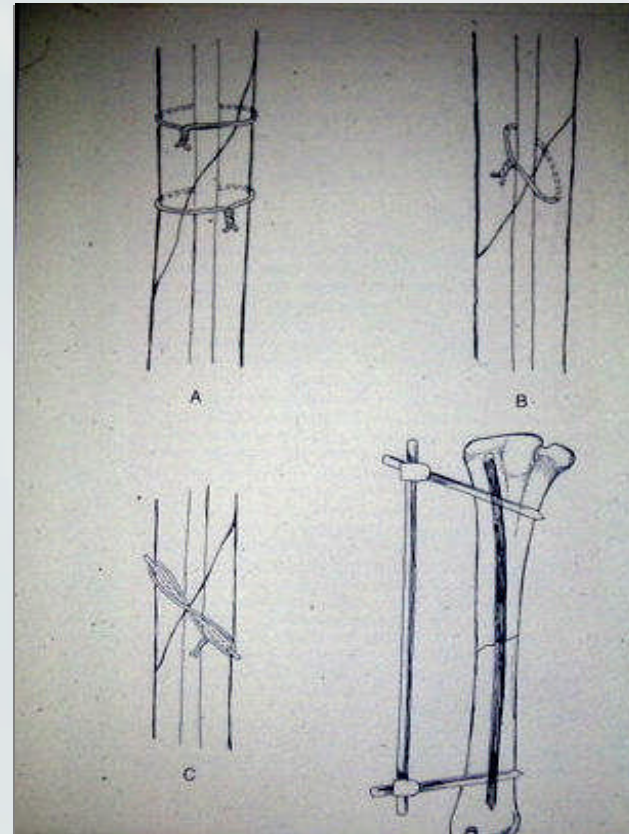


Endoscope

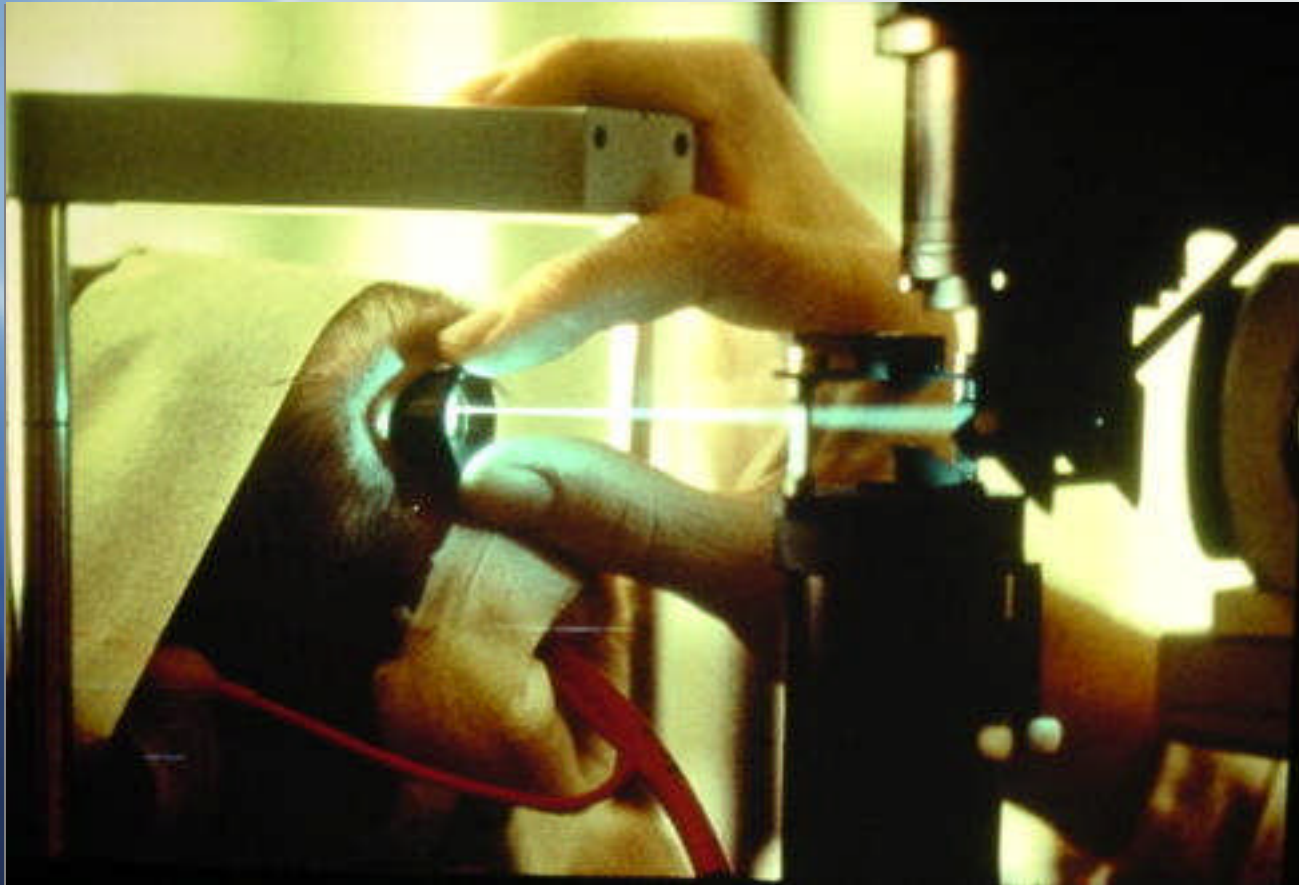


Fracture fixation

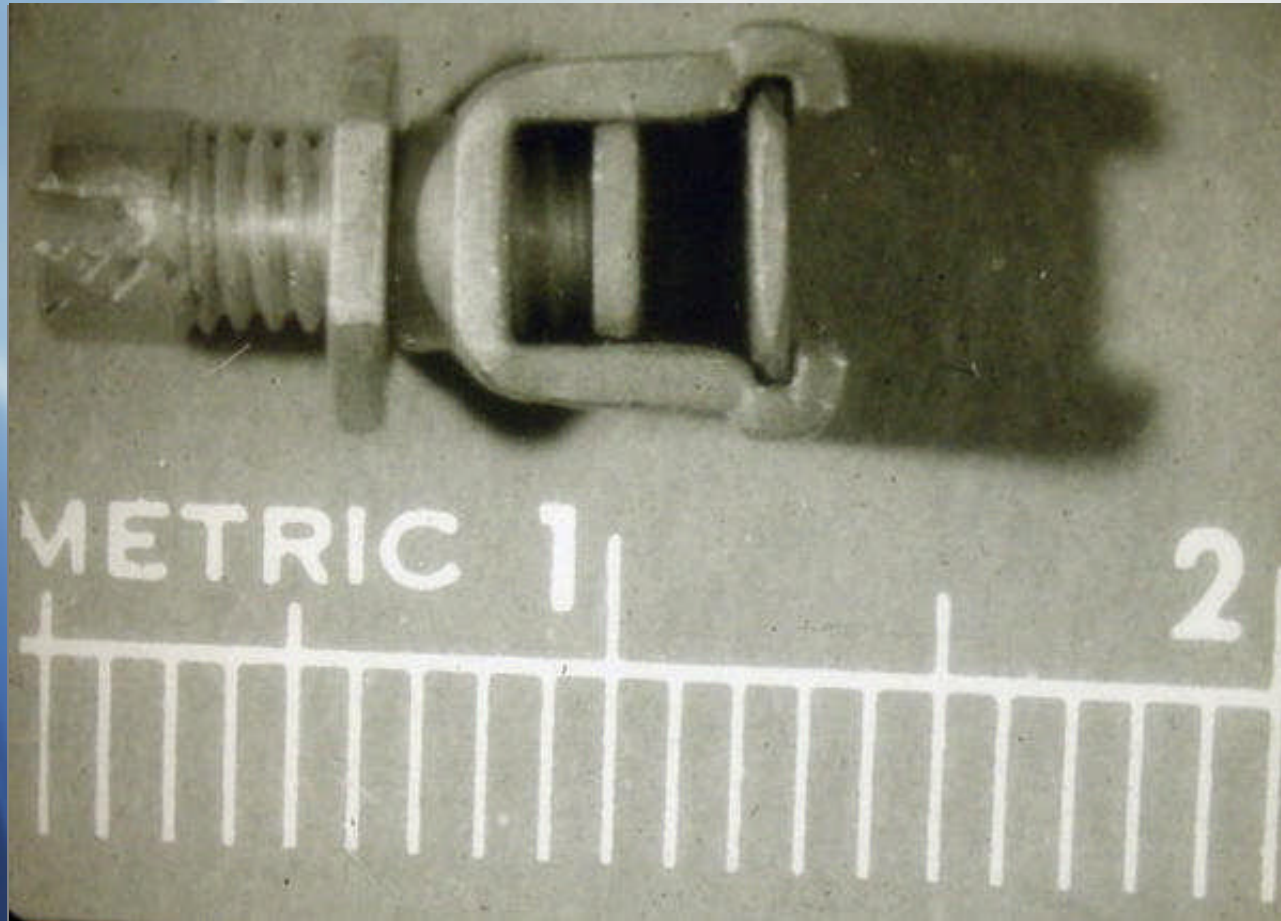
- A.** Intramedullary w full circlage
- B.** Pin and hemicirclage
- C.** Pin, cross pin and figure 8 wire
- D.** Pin and kirshner-Ehmer



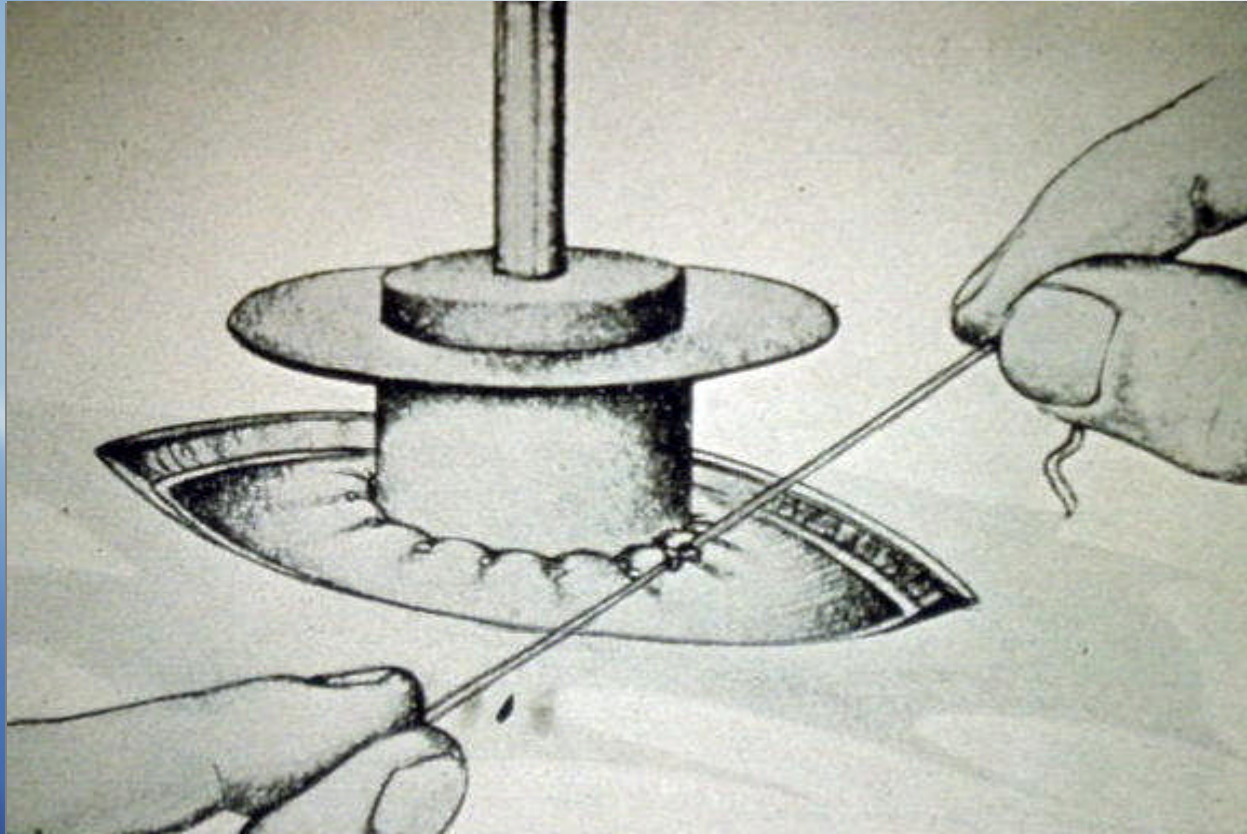
Argon Neon Laser *Light Amplification by Stimulated* *Emission of Radiation*



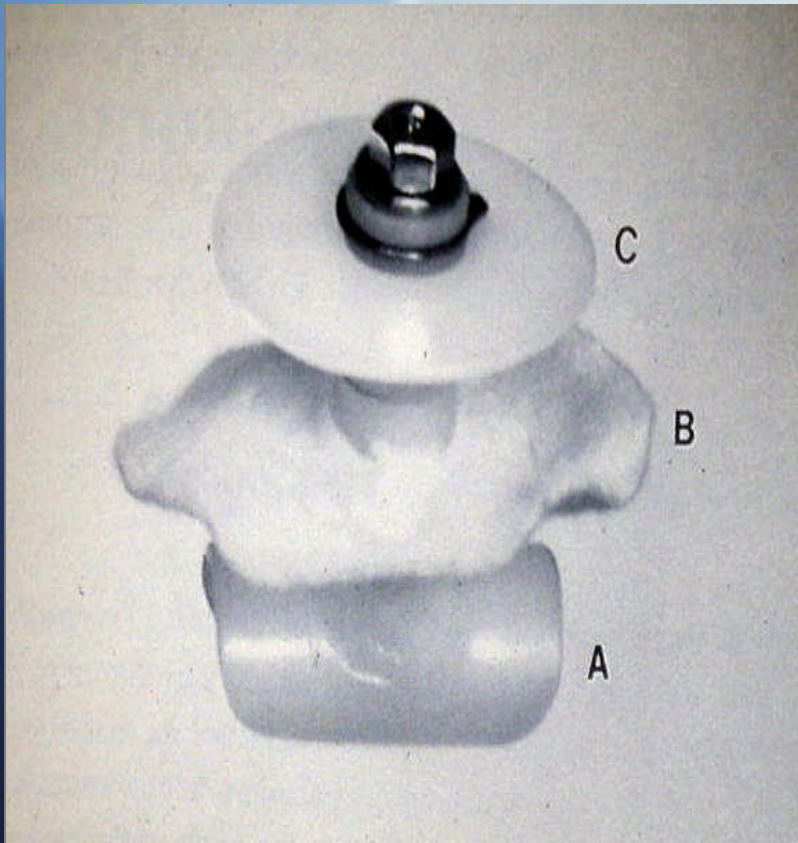
Goldblatt clamp to induce renal hypertension



Pavlov Fistula



A. Swine cecal cannula

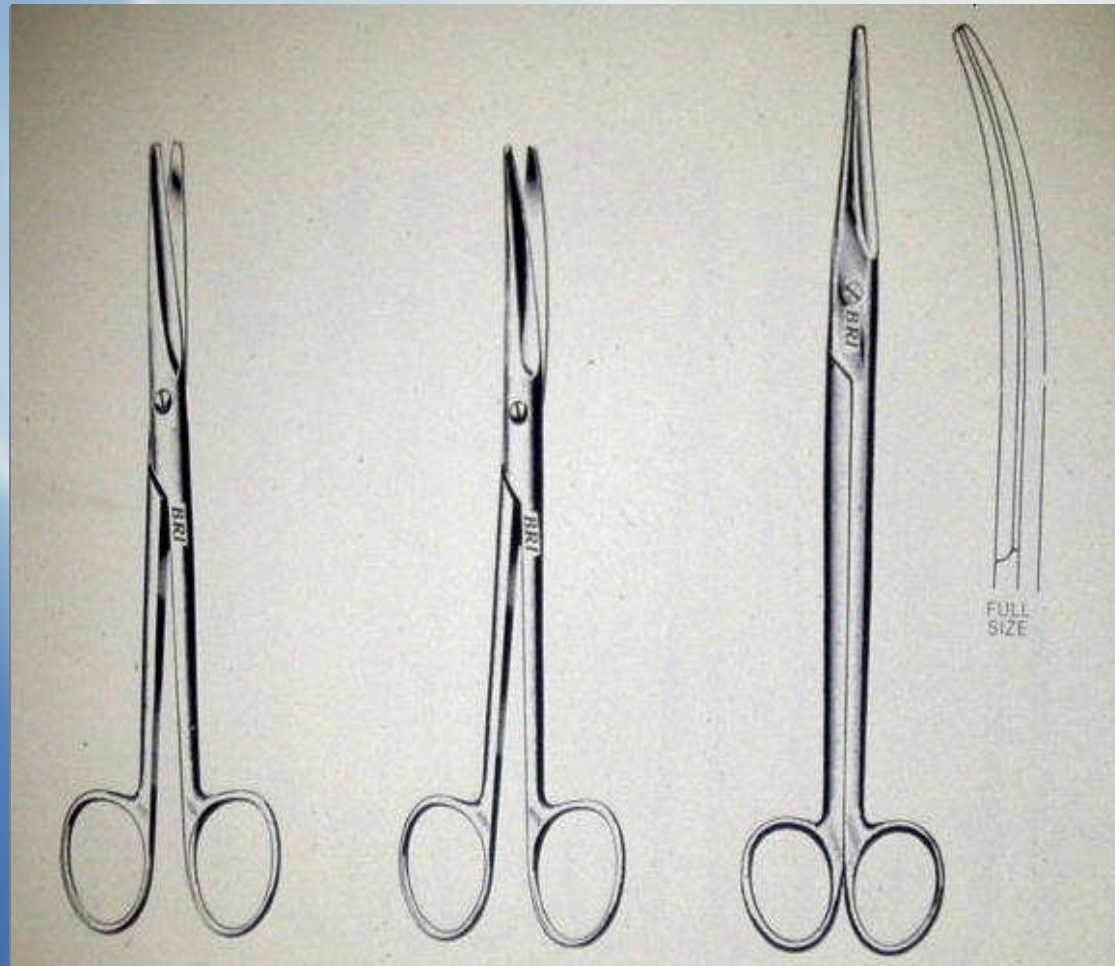


A. Intraluminal portion

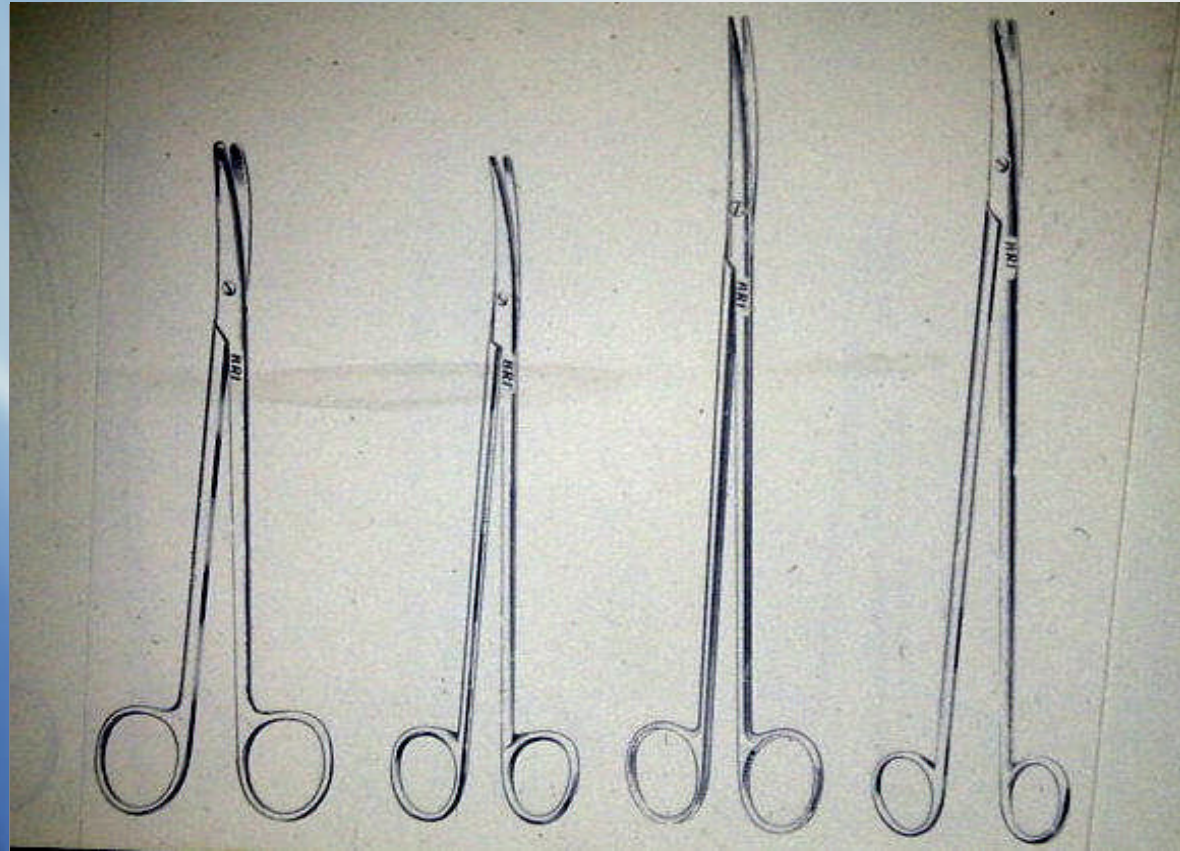
**B. Felf cuff sutured to
serosa of cecum**

C. Externalized portion

Mayo scissors

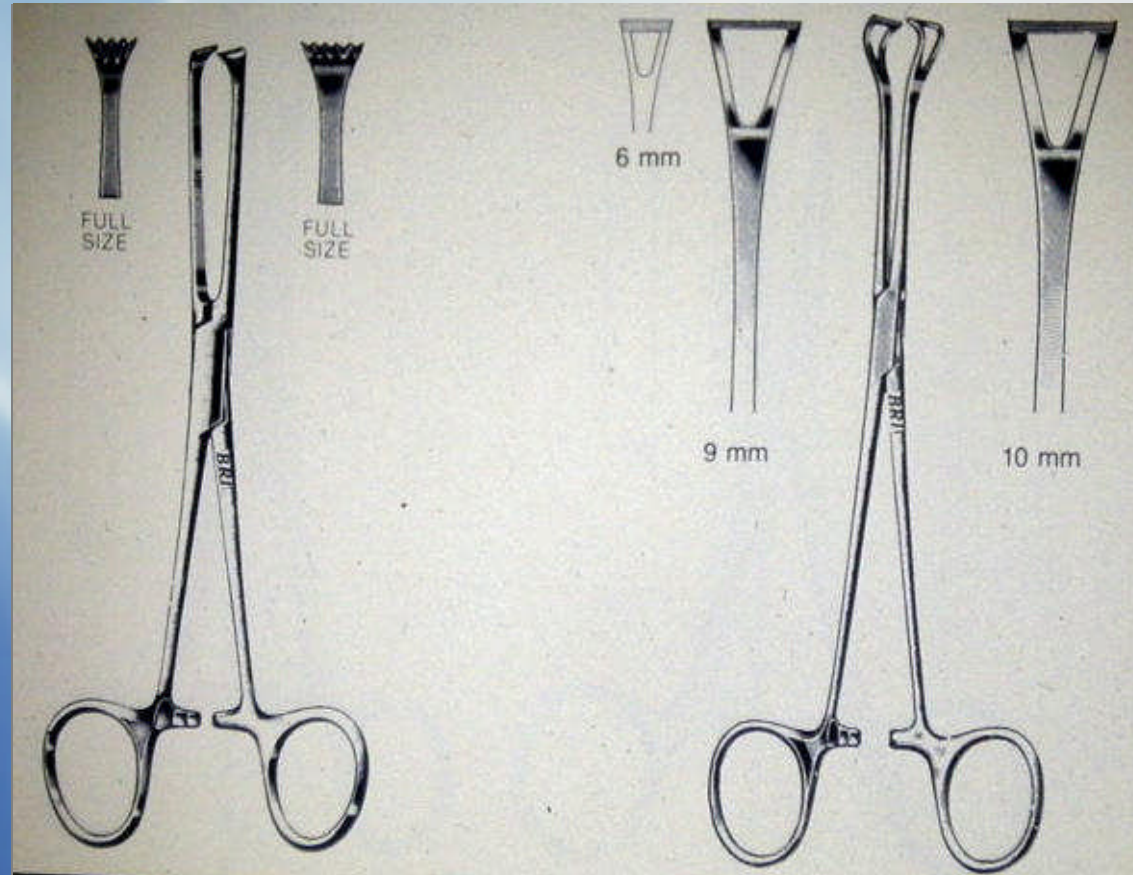


Metzenbaum scissors

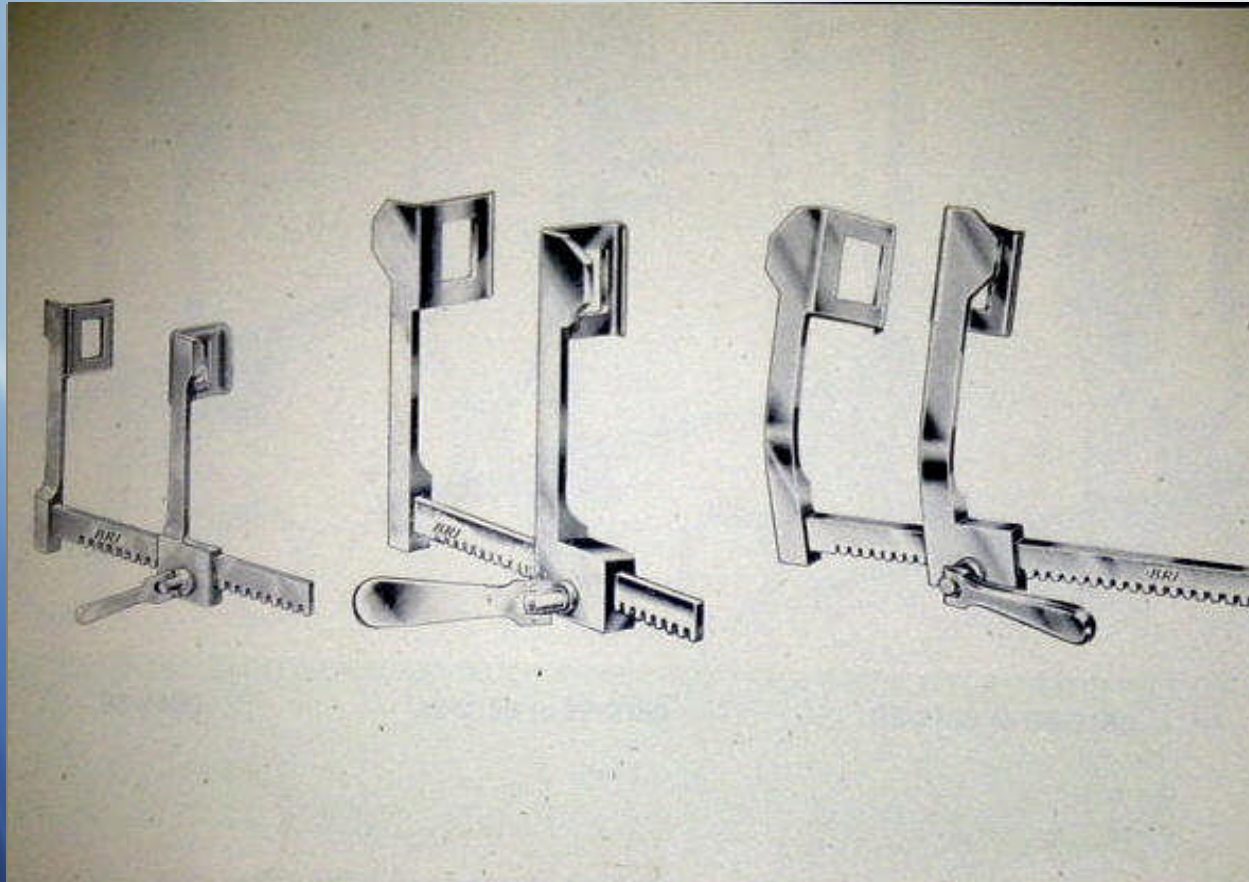


Allis Tissue Forceps

Babcock Intestinal Forceps



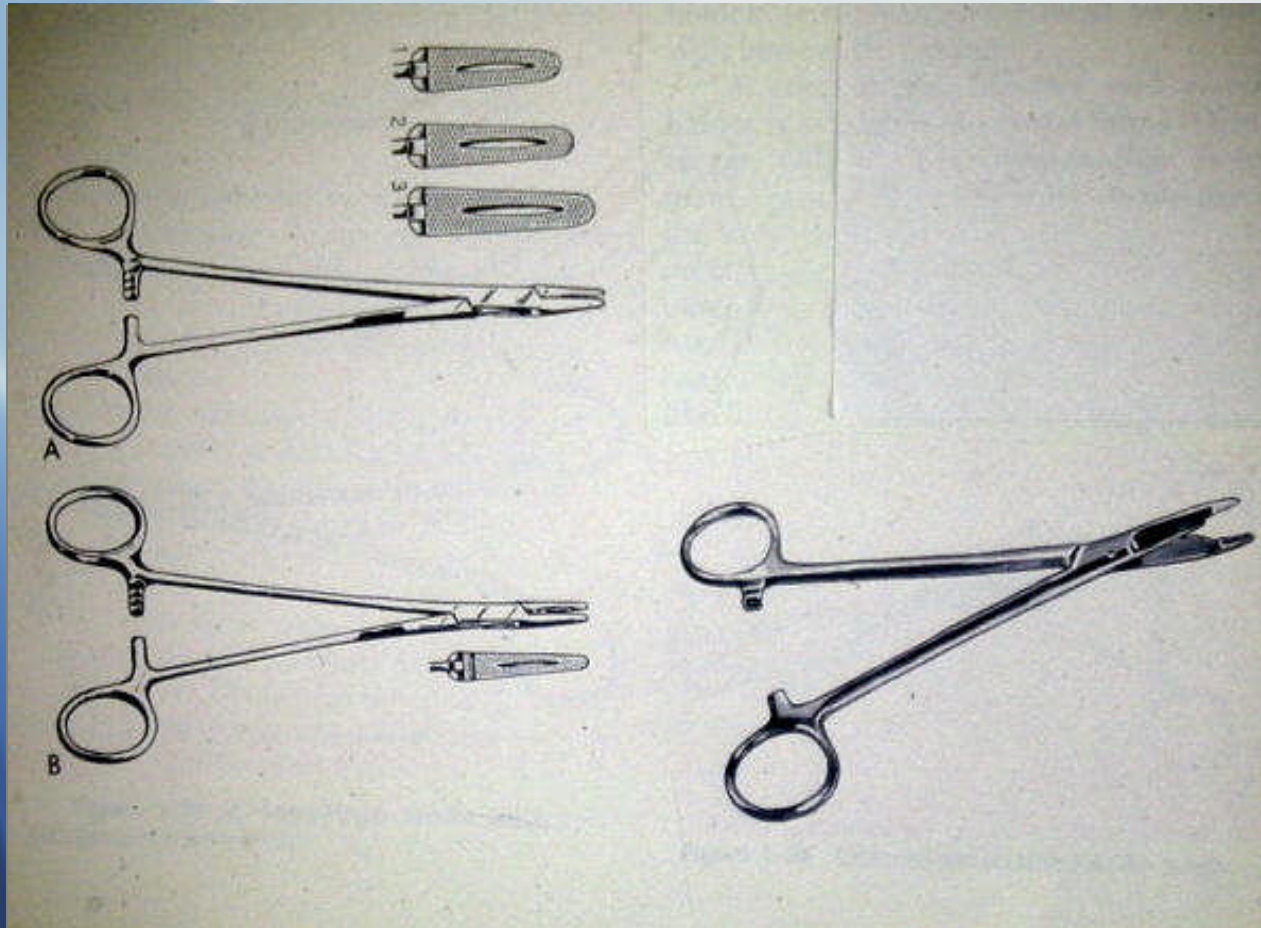
Finochietto rib spreaders



Senn retractor



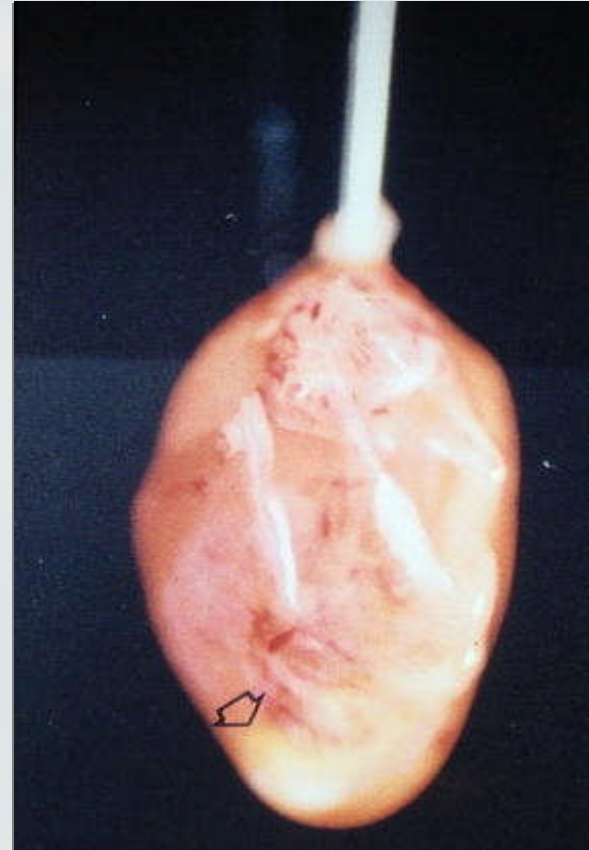
Needle holders



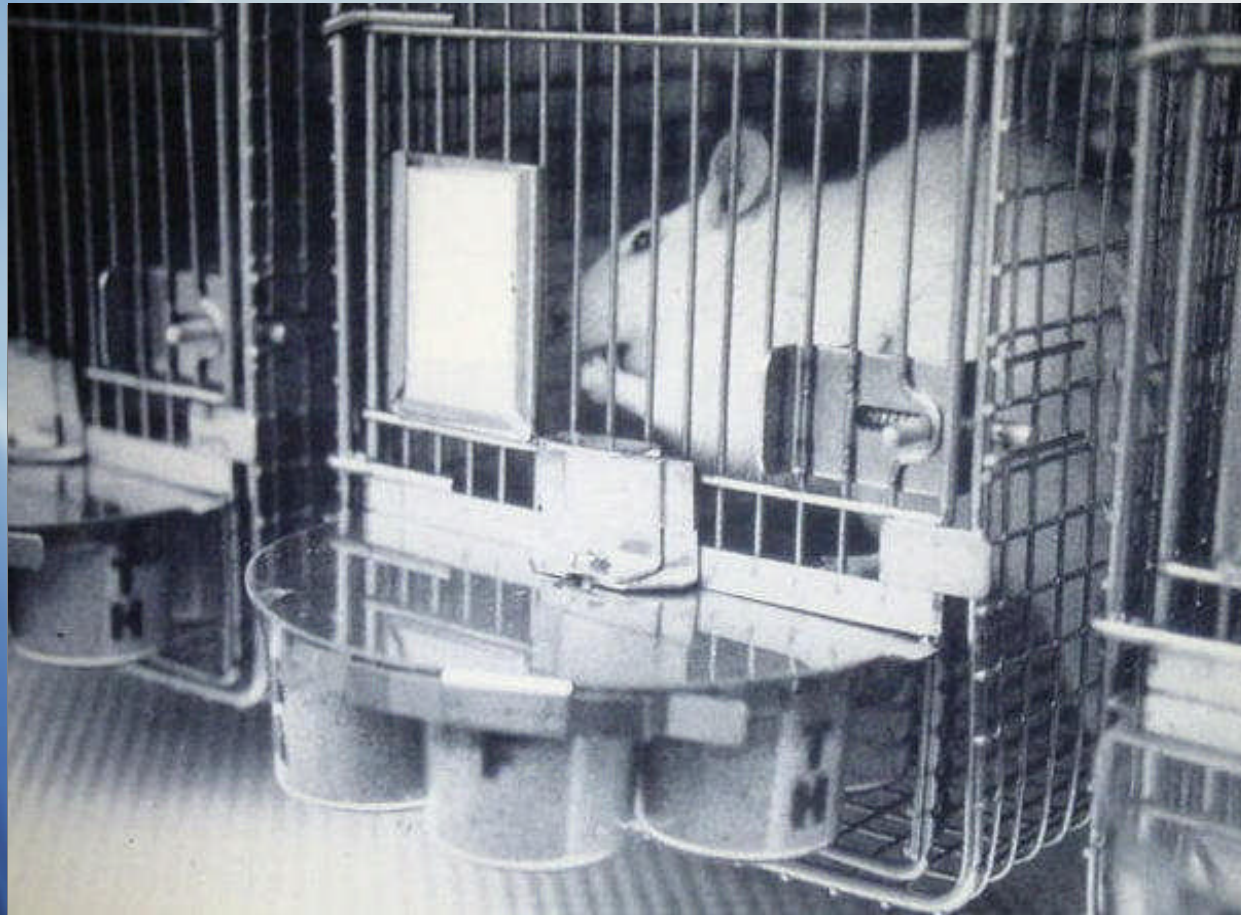
Bovie-electrosurgical unit with ground plate



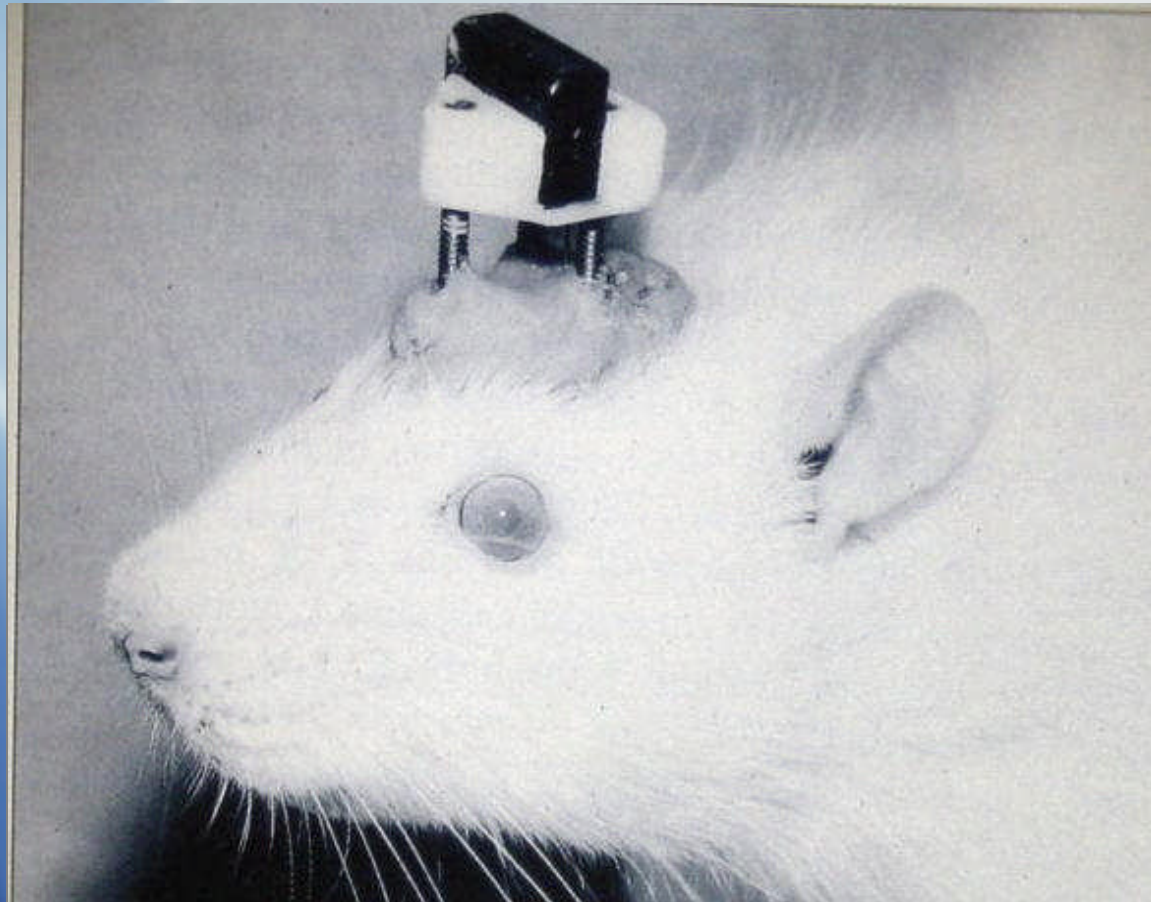
Myocardial injury by trans-thoracic cauterization



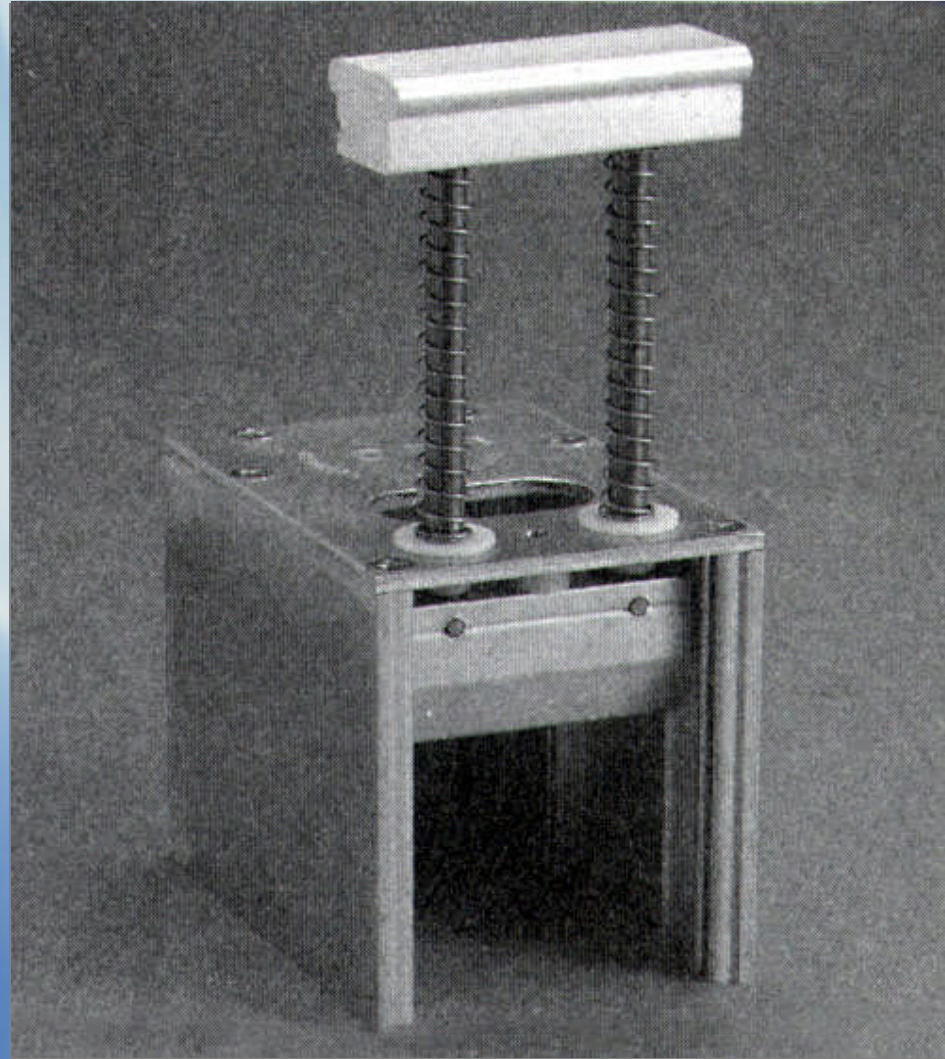
Diet optimization device



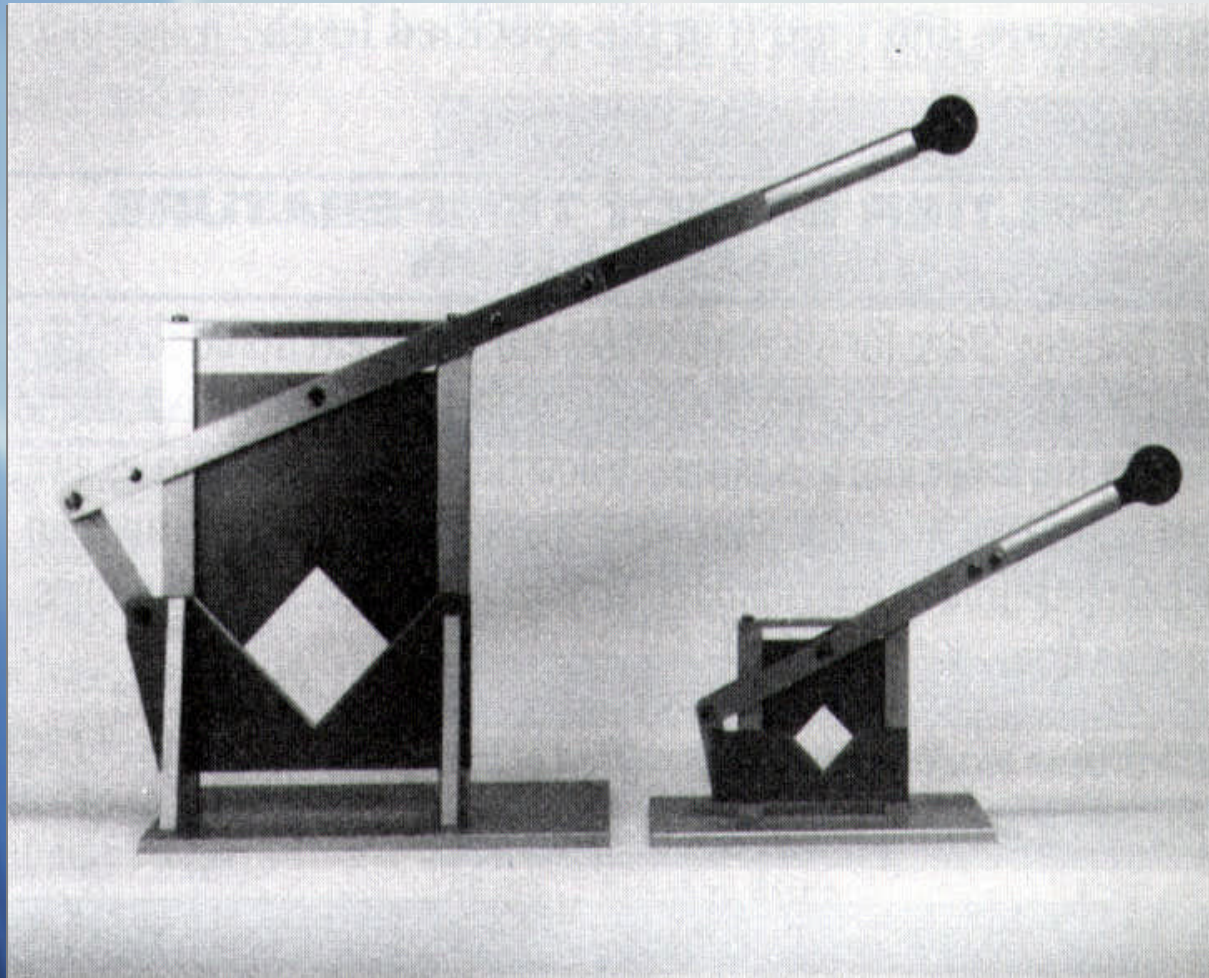
Rat with head implant



Rodent Cervical Dislocator



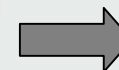
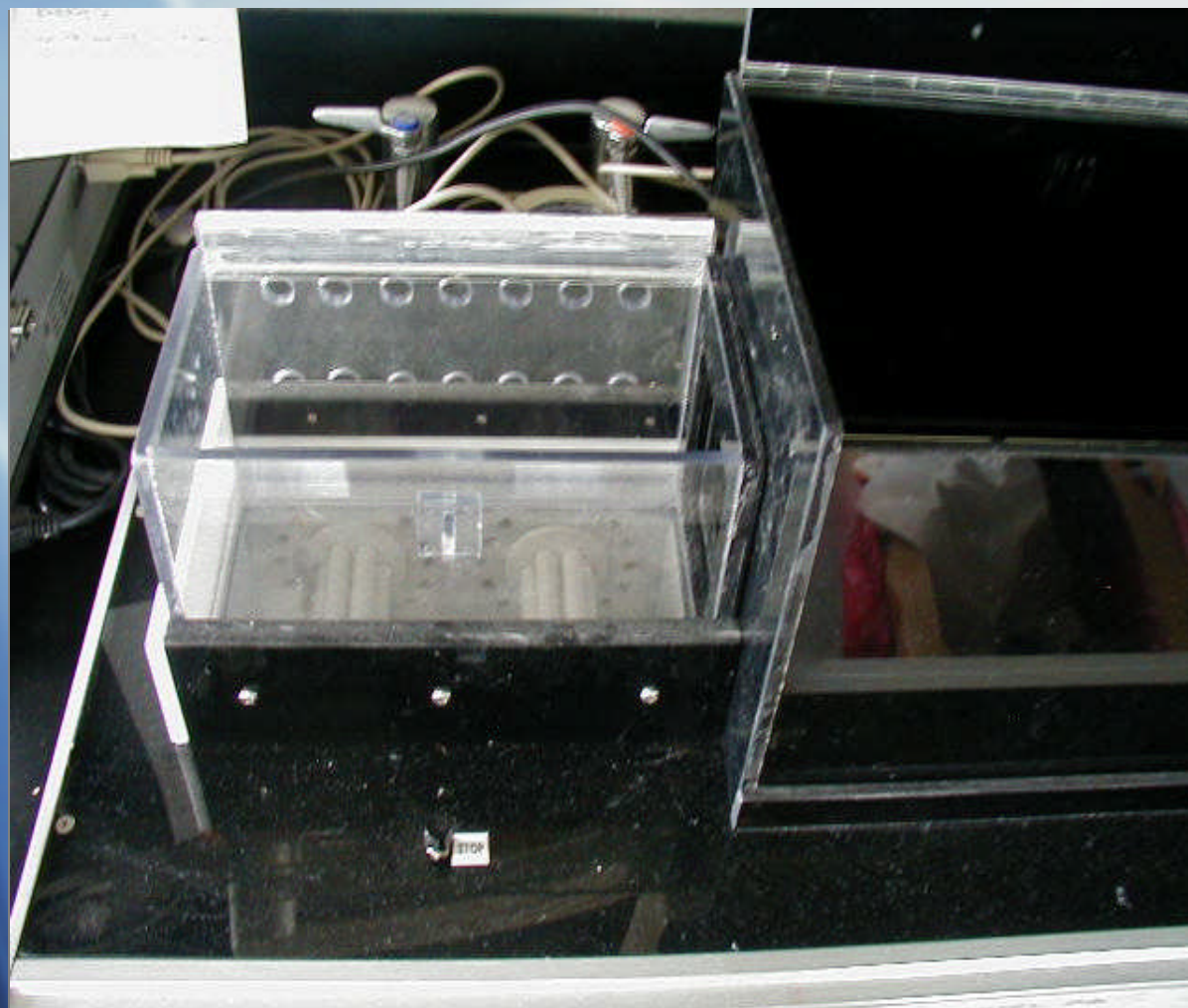
Large & Small Animal Decapitator (Guillotine)



Shuttle avoidance box (side view)



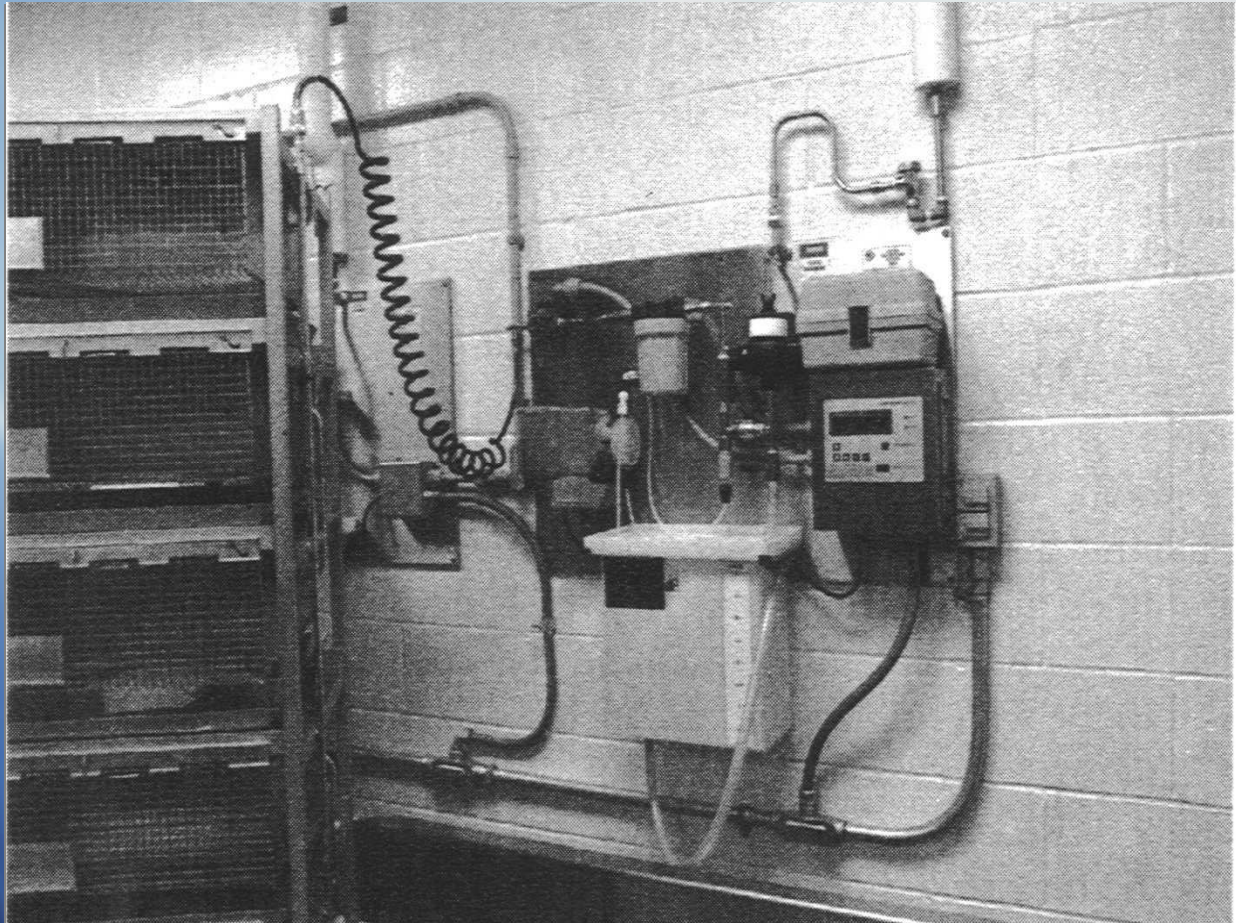
Shuttle avoidance box (top view)



Fogger



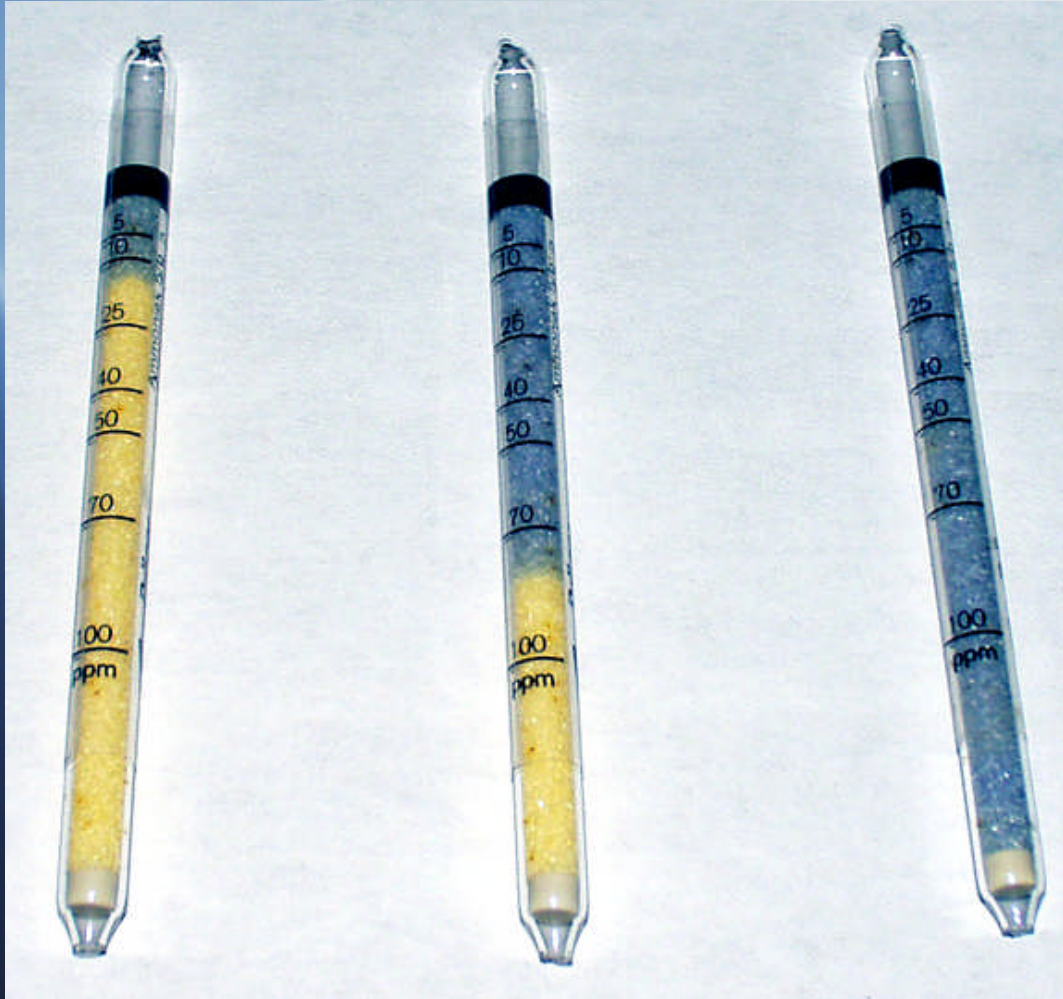
Rack Flush Station



Follower (on left) for Feeding Powdered Rodent Diets



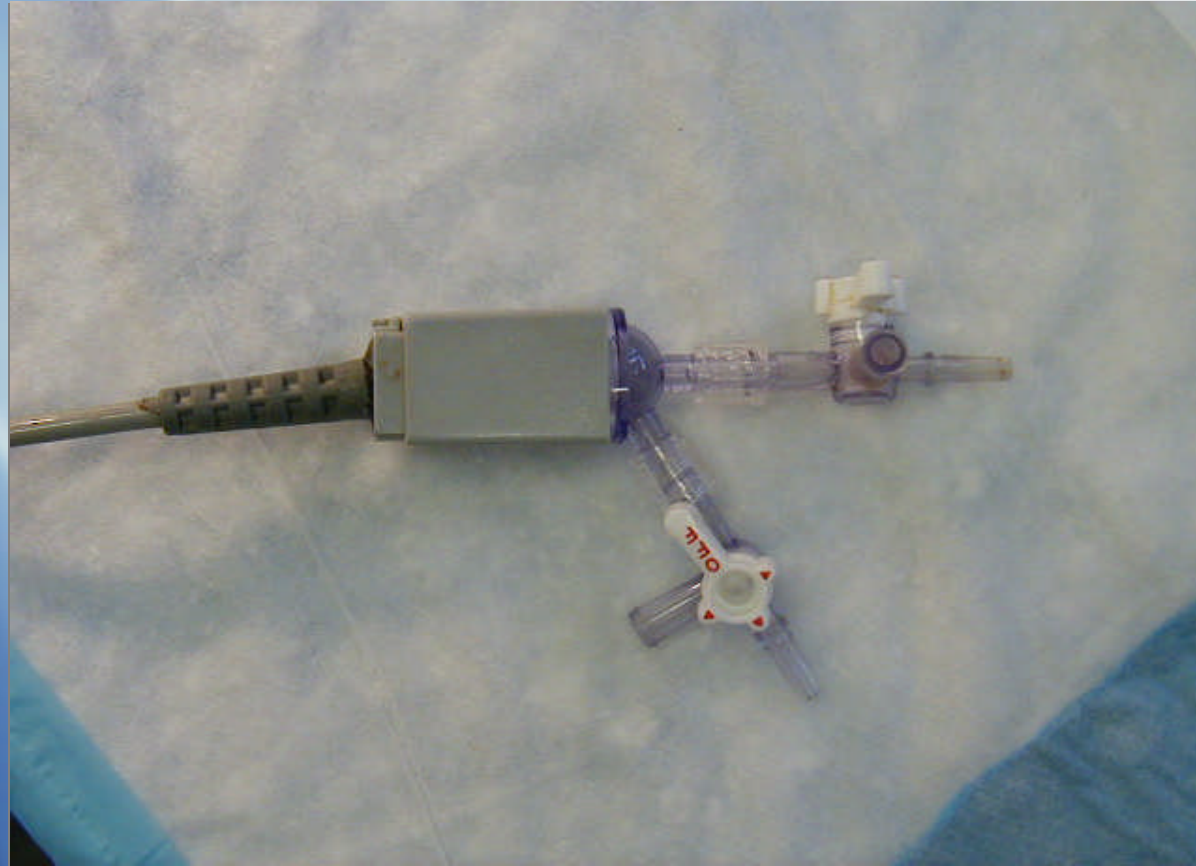
Dräger Tubes



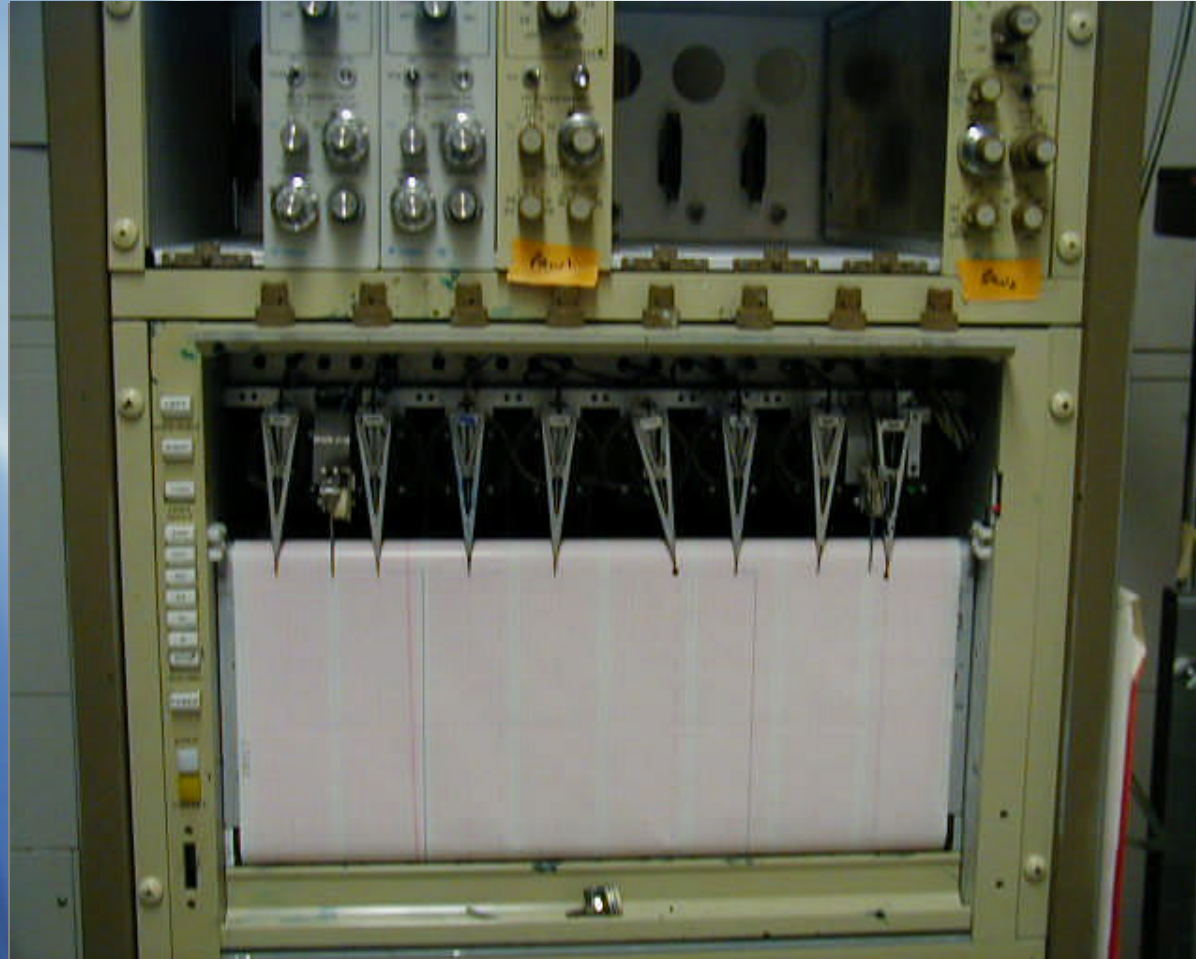
- Used for detection of environmental ammonia.
- Blue color change indicates ammonia level in ppm.
- The first tube is within the 25 ppm standard, but 2nd and 3rd tube far exceed 25 ppm.



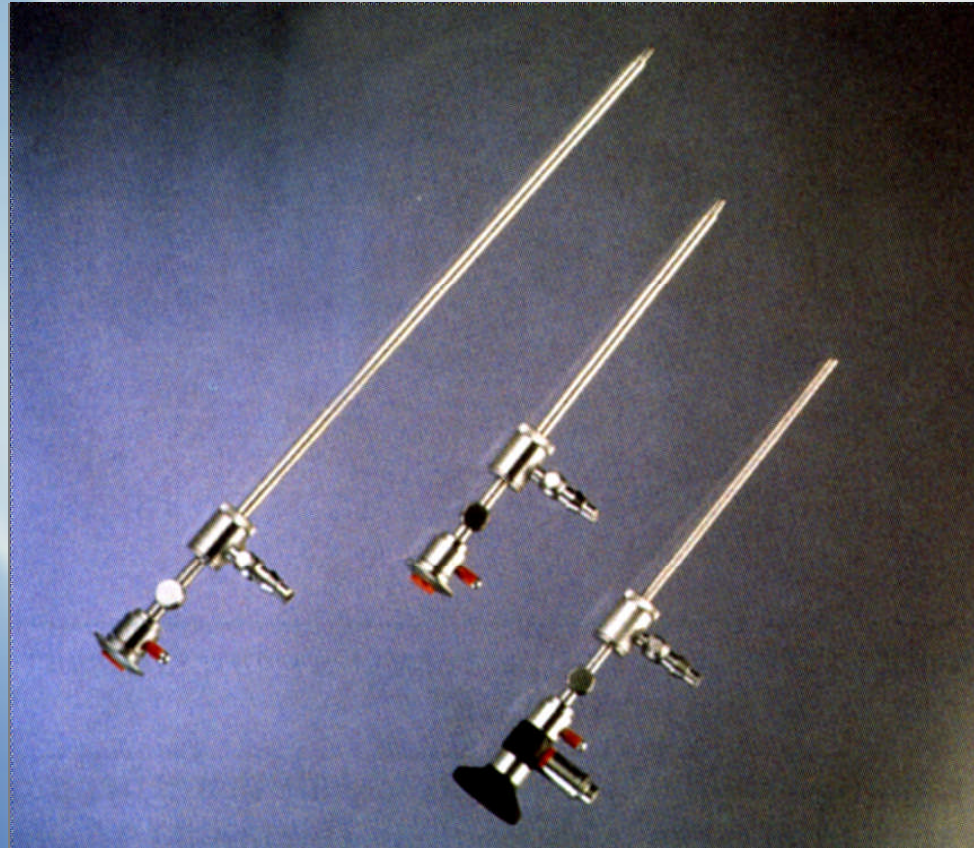
Blood pressure transducer



Gould pressure transducer recorder



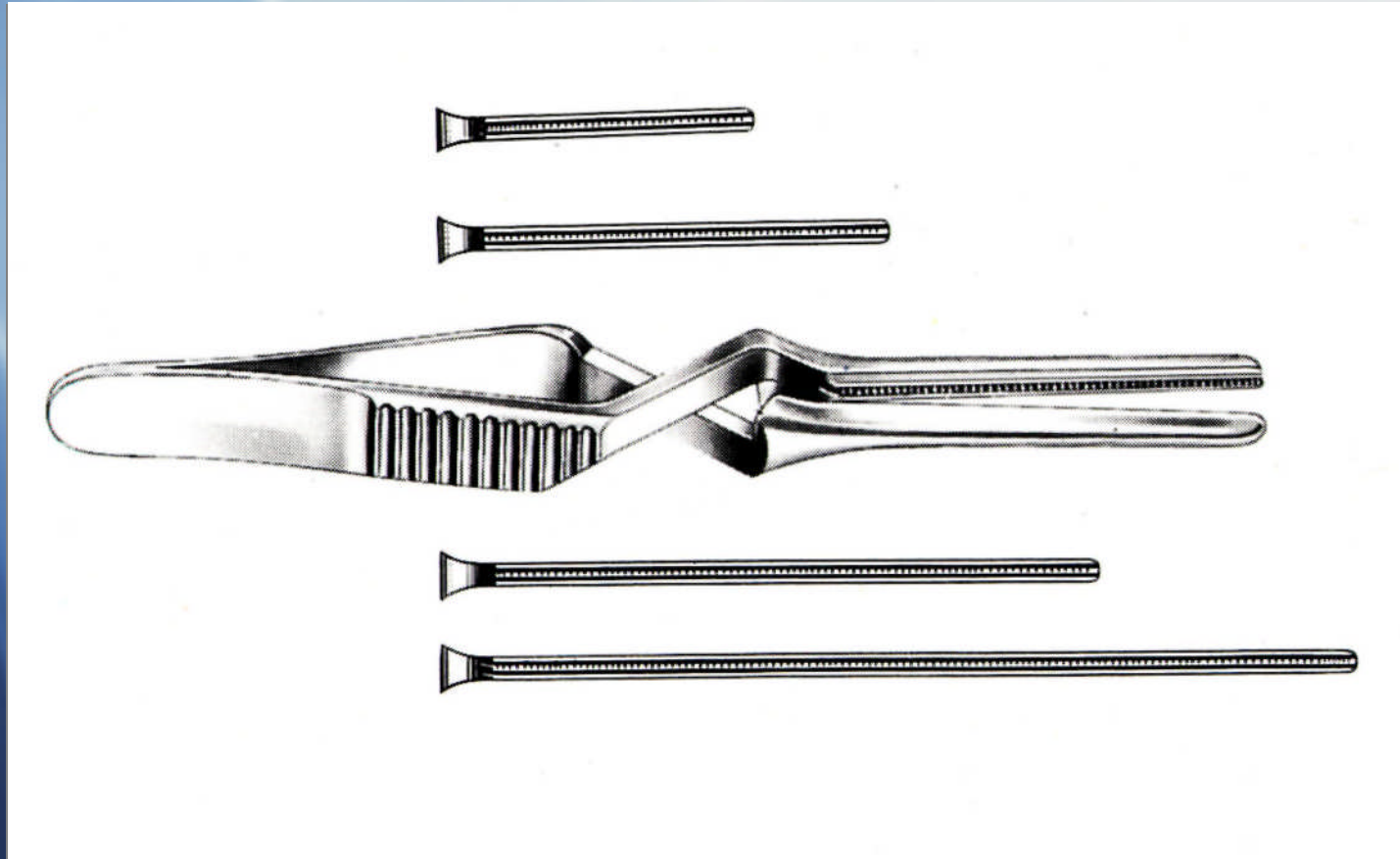
Verres Needle (Catheter)



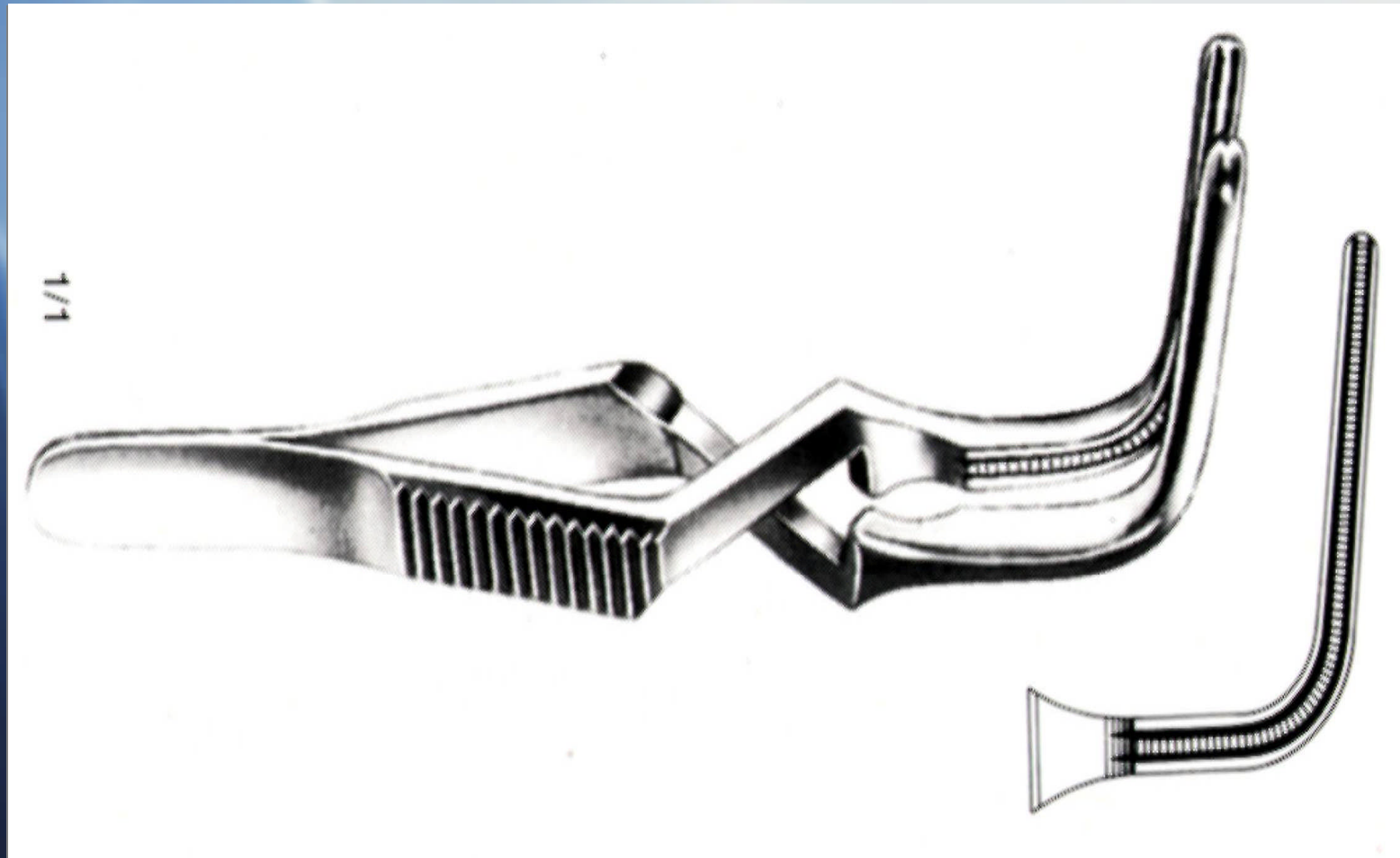
- CO₂ insufflation of abdomen for endoscopy



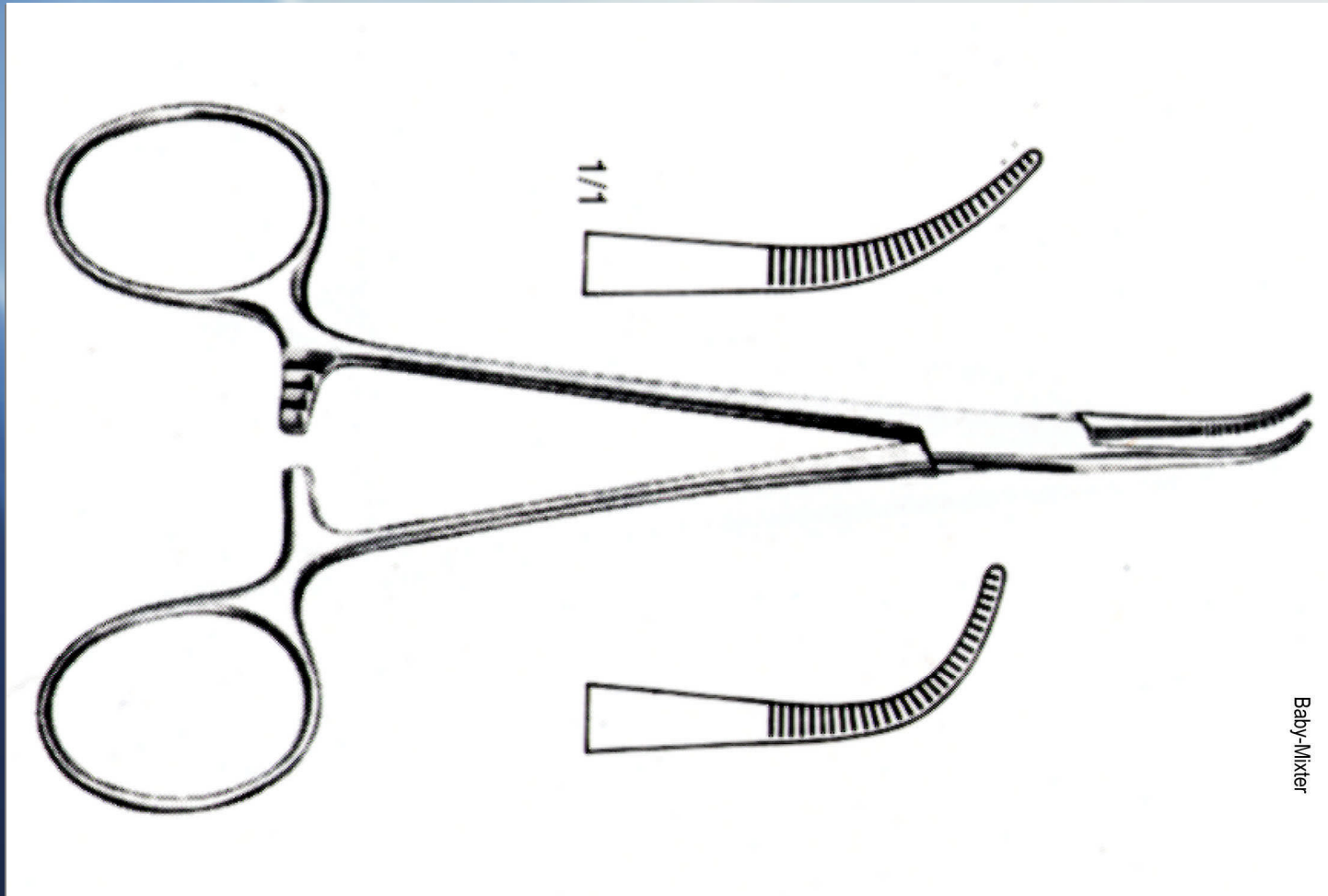
De Bakey Atraumatic Bulldog Clamp



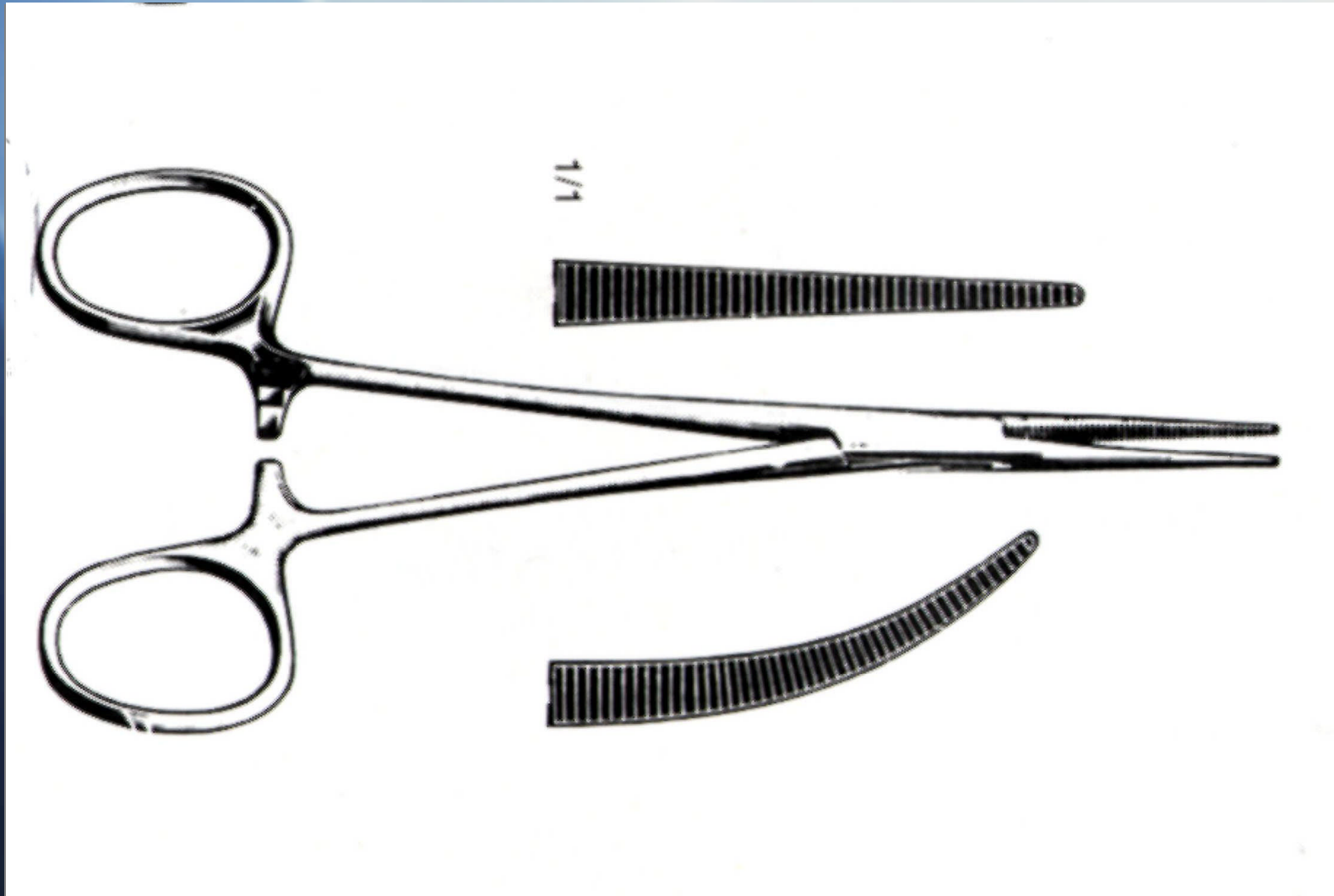
Santulli Atraumatic Bulldog Clamps



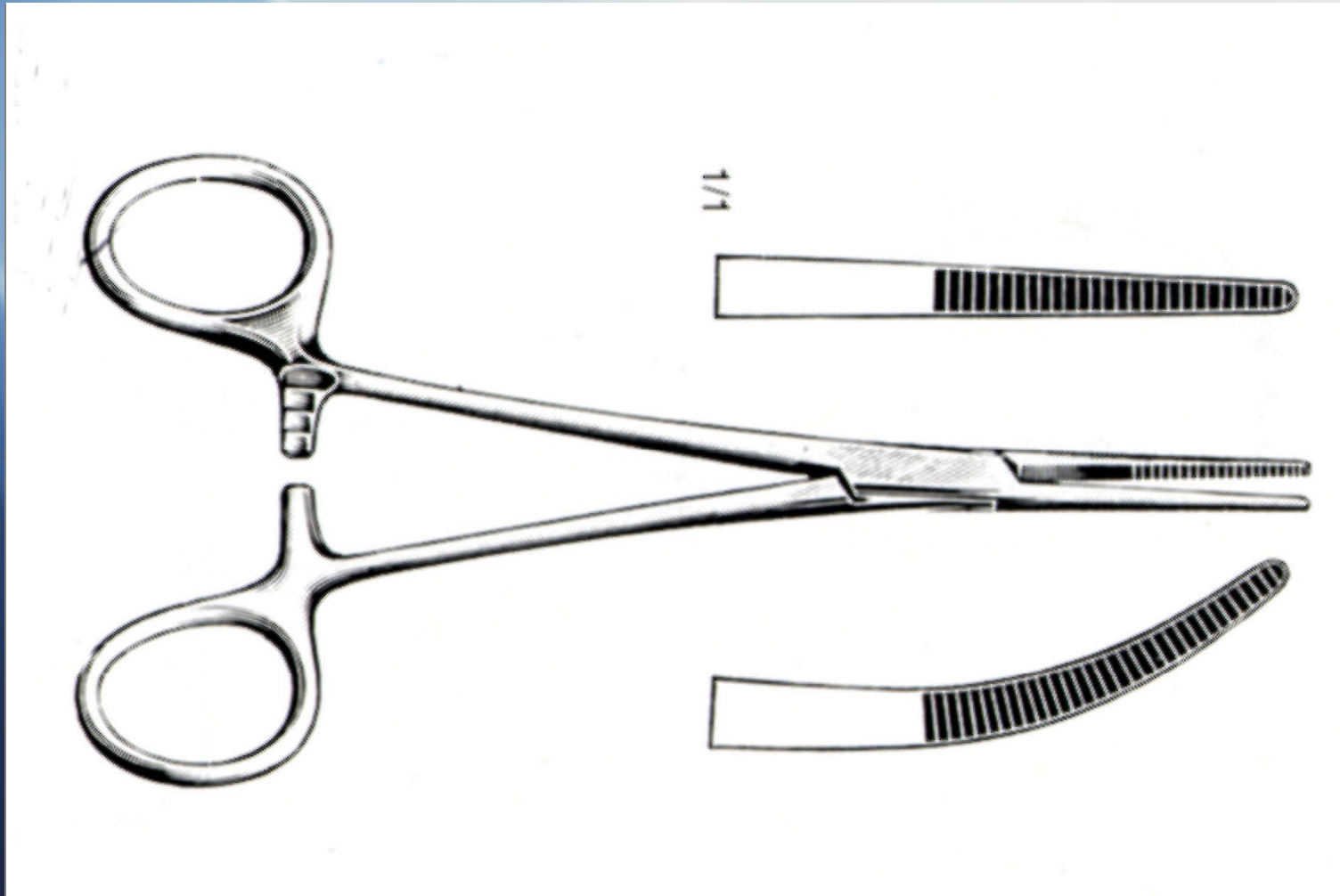
Baby Mixer Forceps: Hemostatic forceps



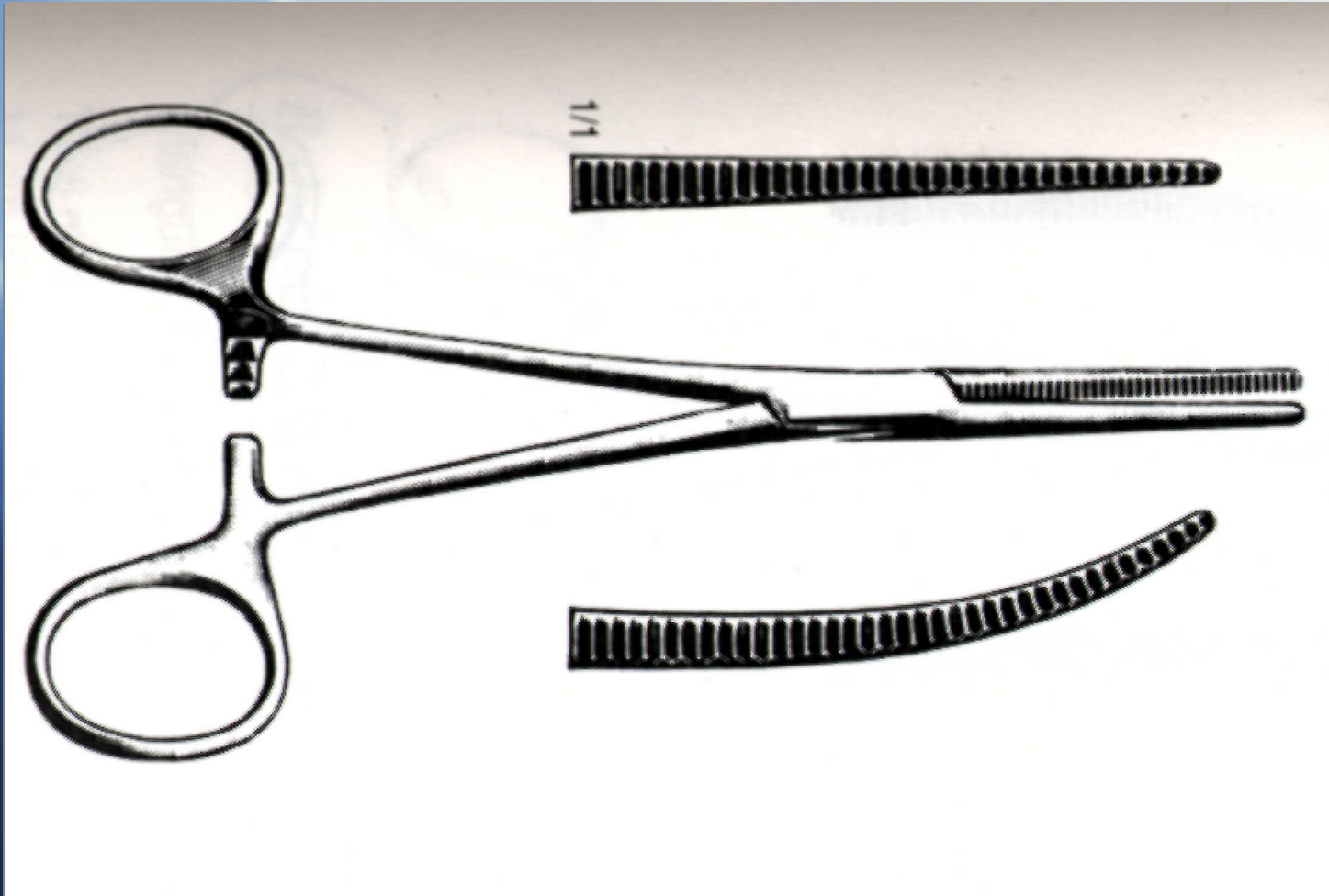
Crile Forceps: Hemostatic forceps



Kelly Forceps: (straight & curved) hemostatic forceps



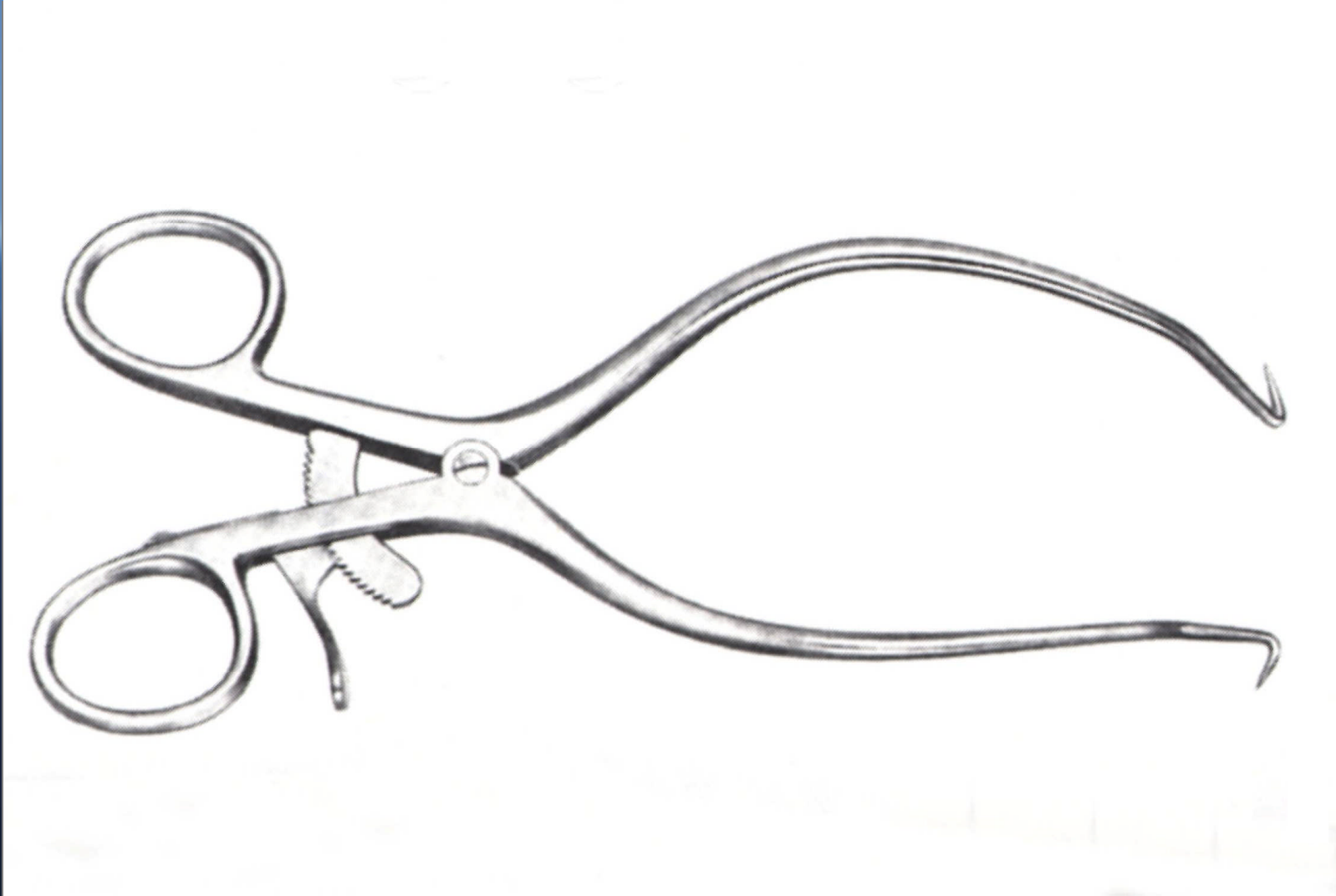
Pean Forceps: (straight & curved) hemostatic forceps



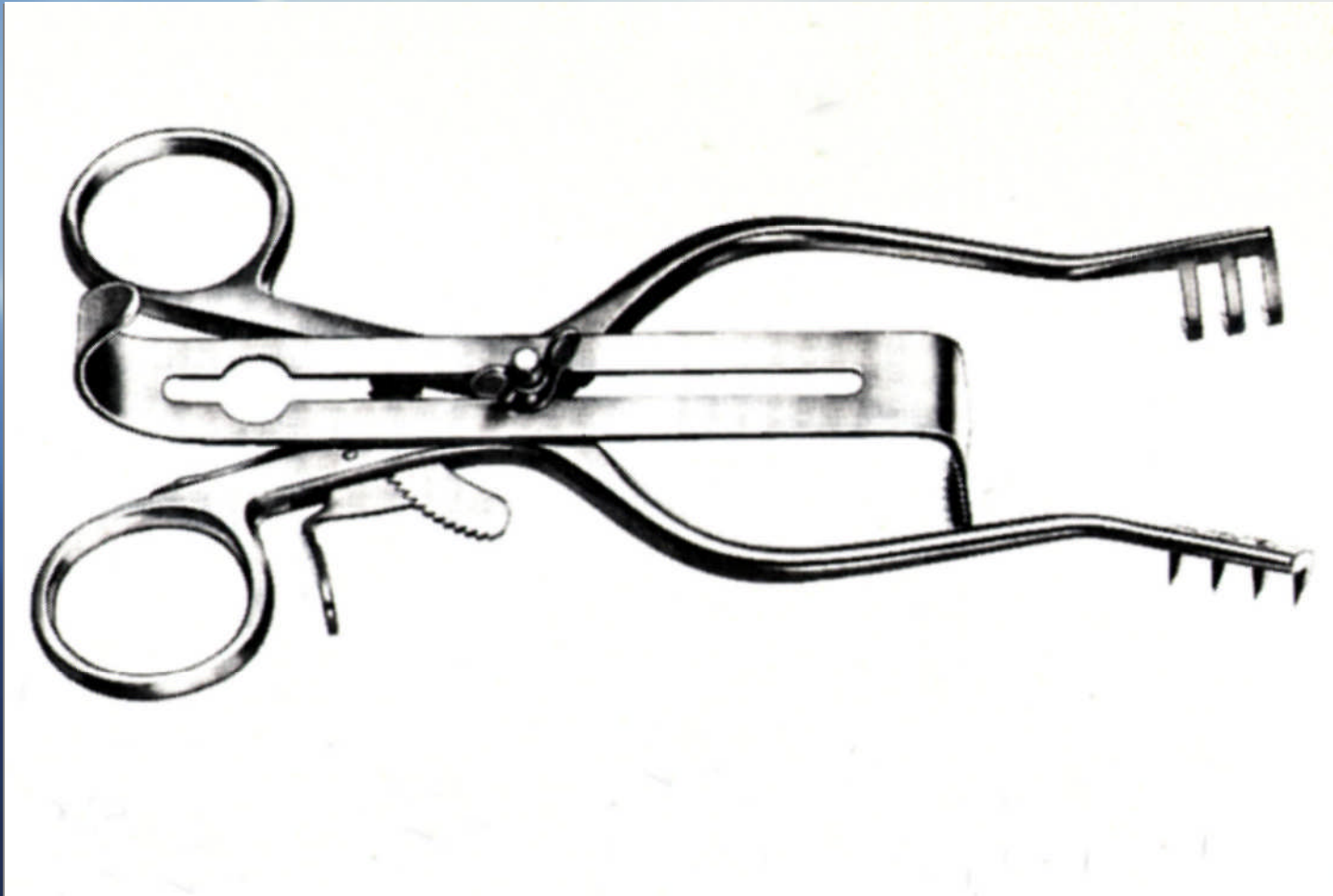
Hartman Forceps: Hemostatic forceps



Gelpi Retractor: muscle retractor



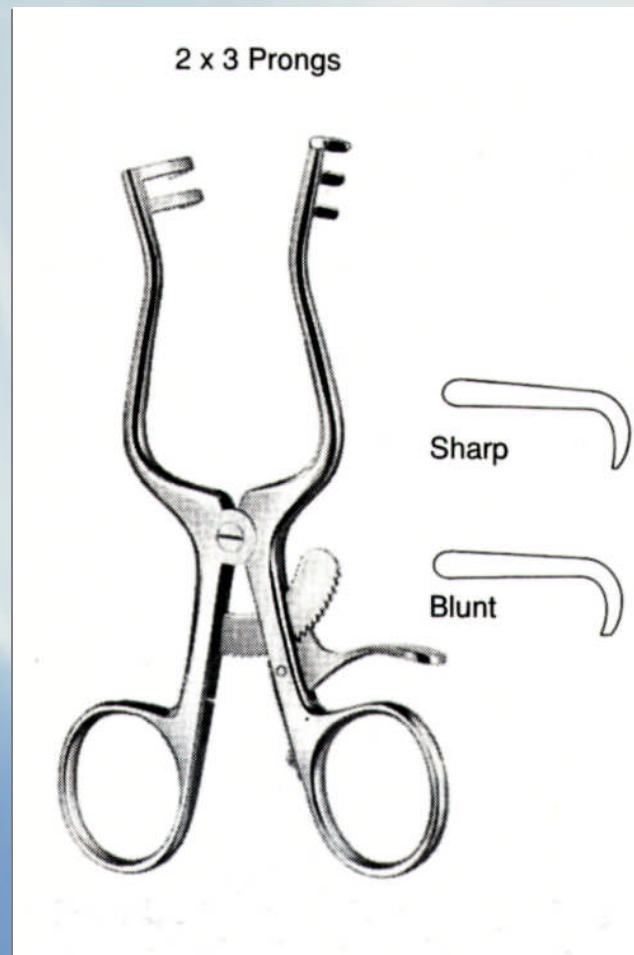
*Henley Retractors w/ center blade: (sharp
or blunt teeth)*



Weitlaner Retractors w/ center blade



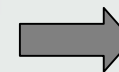
Weitlaner Retractor: (sharp or blunt teeth)



Microsurgical scissors, eyelid retractors, & Sterling probe



Spectrophotometer

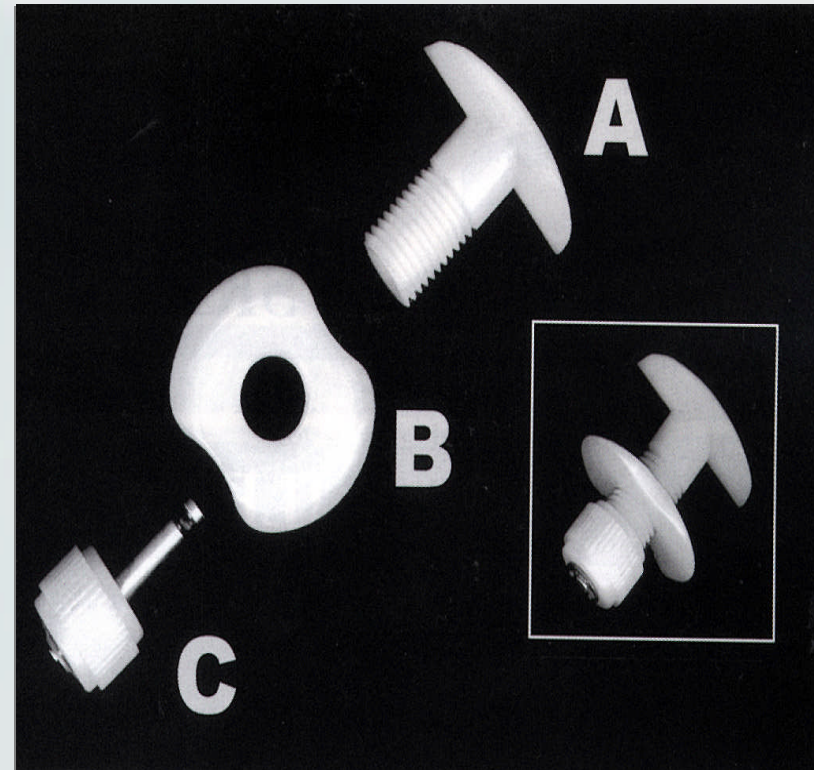


Spectrophotometer (opened up)

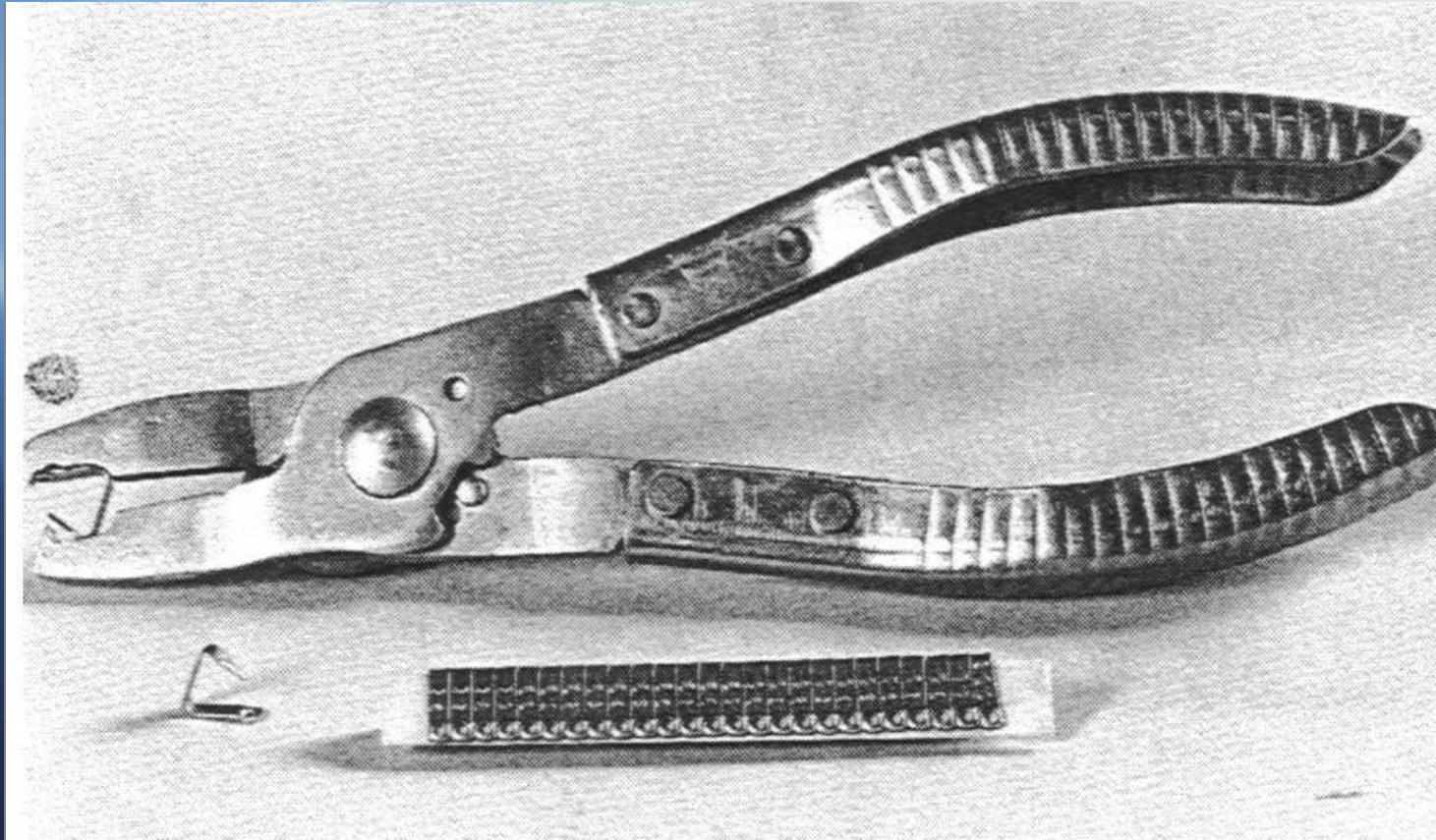


Ileal cannula

- (A) T-piece
- (B) Retaining plate
- (C) intraluminal plug
- not a viable technique for collecting ileal fluid samples in cats due to complications.



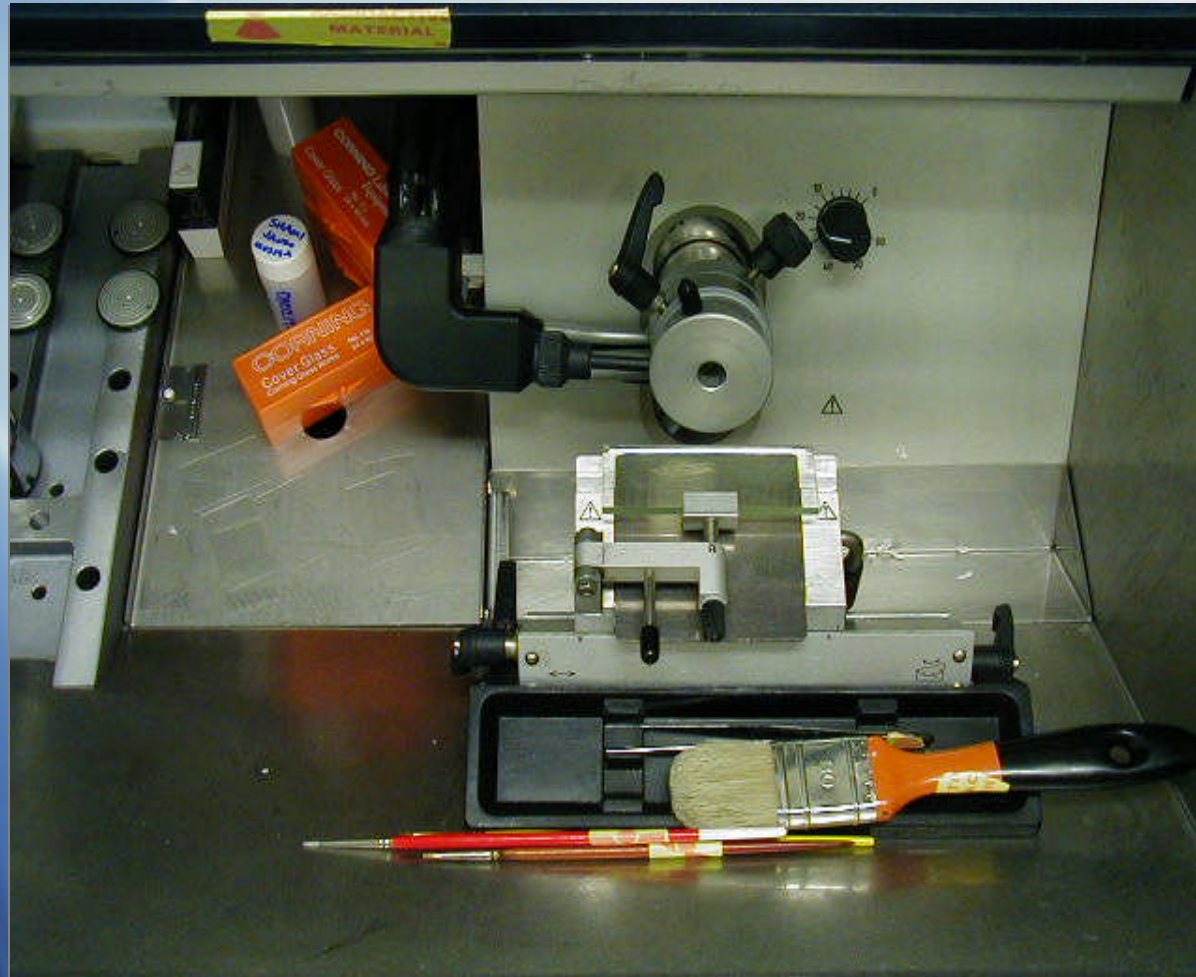
Rodent number ear tags and applicator



Cryostat - Leica CM1900 (external view)



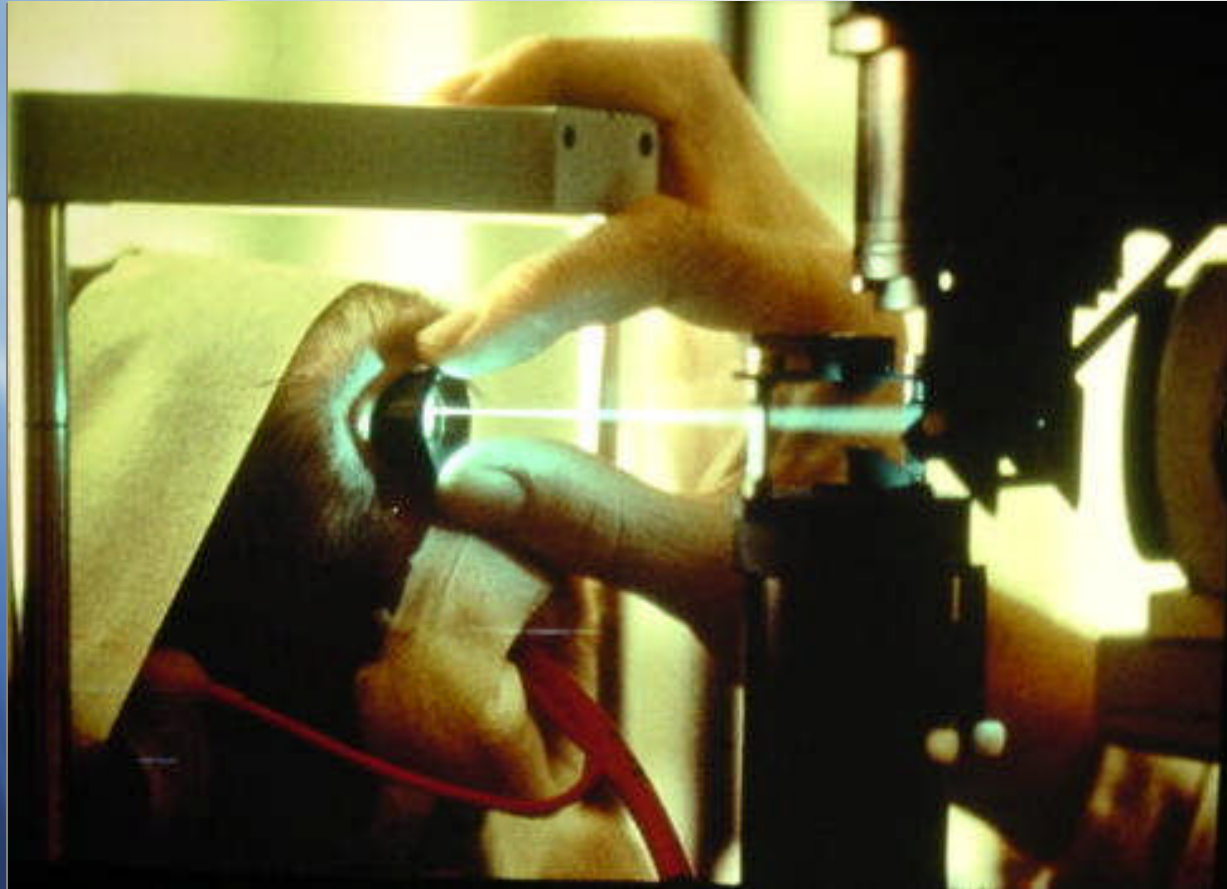
Cryostat - Leica CM1900 (internal view)



PlasLab Isolator



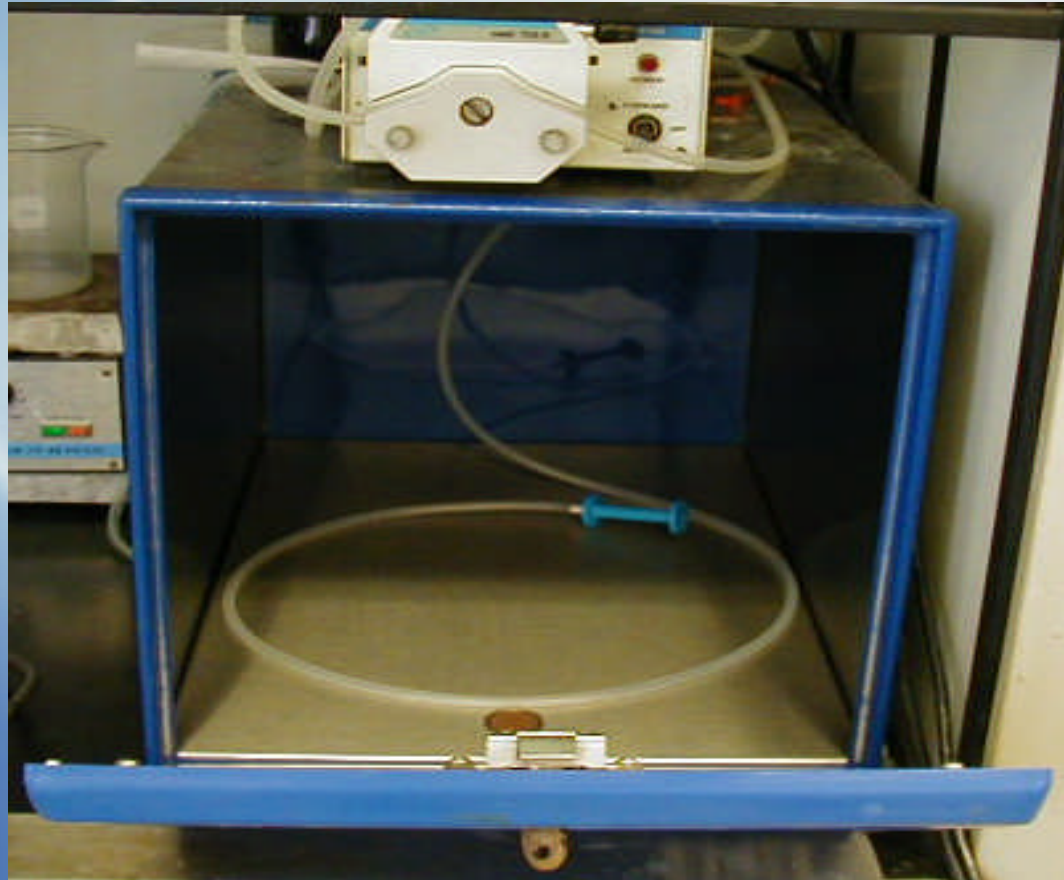
Argon Neon Laser ***Light Amplification by Stimulated***



Ethylene oxide (ETO) sterilizer (external view)



Ethylene oxide (ETO) sterilizer (internal view)



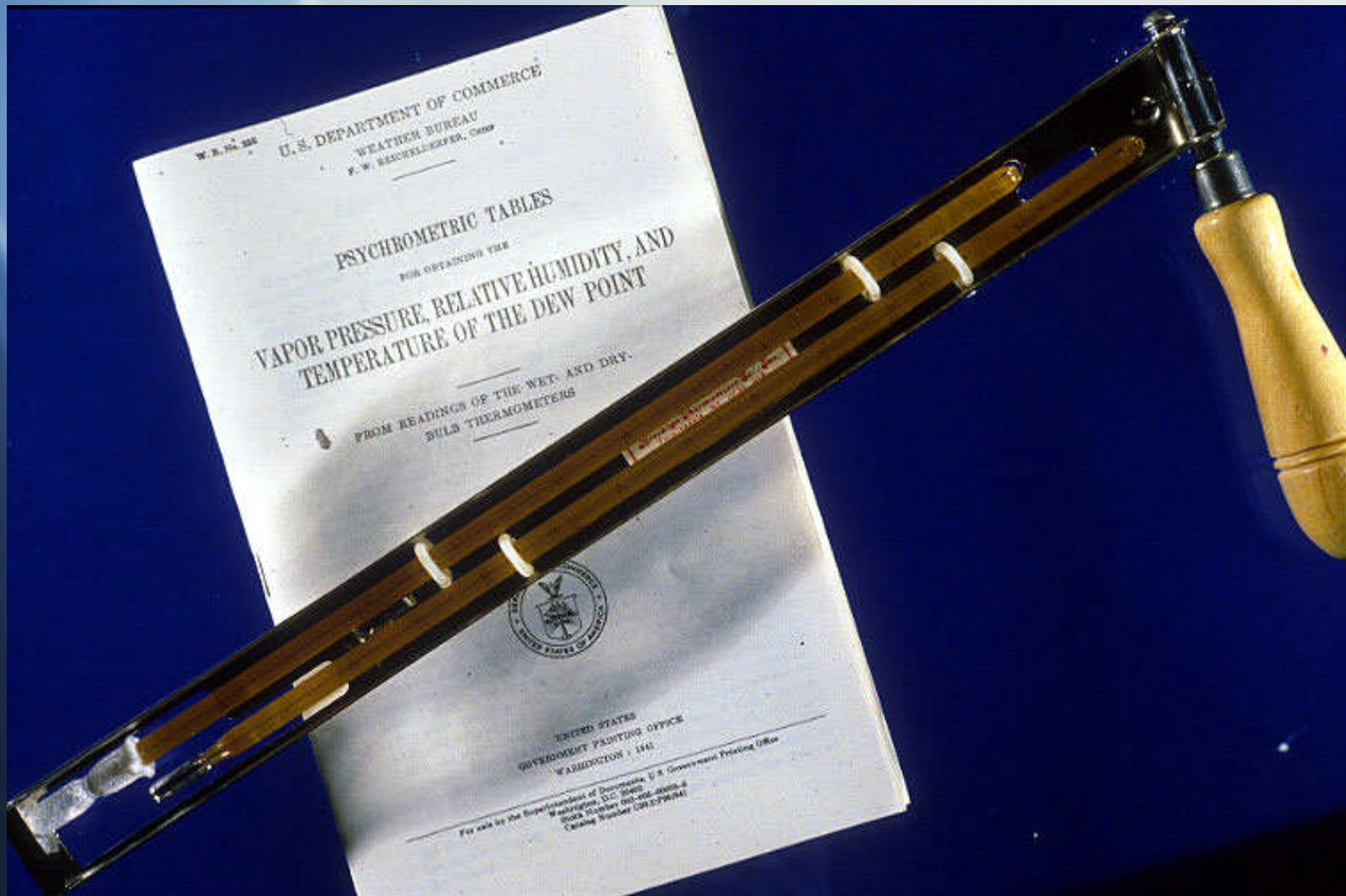
Wand Anemometer (Velometer)



Measures air
flow or velocity



Sling Psychrometer



Environmental Monitoring System



Computerized room temperature & humidity monitoring system



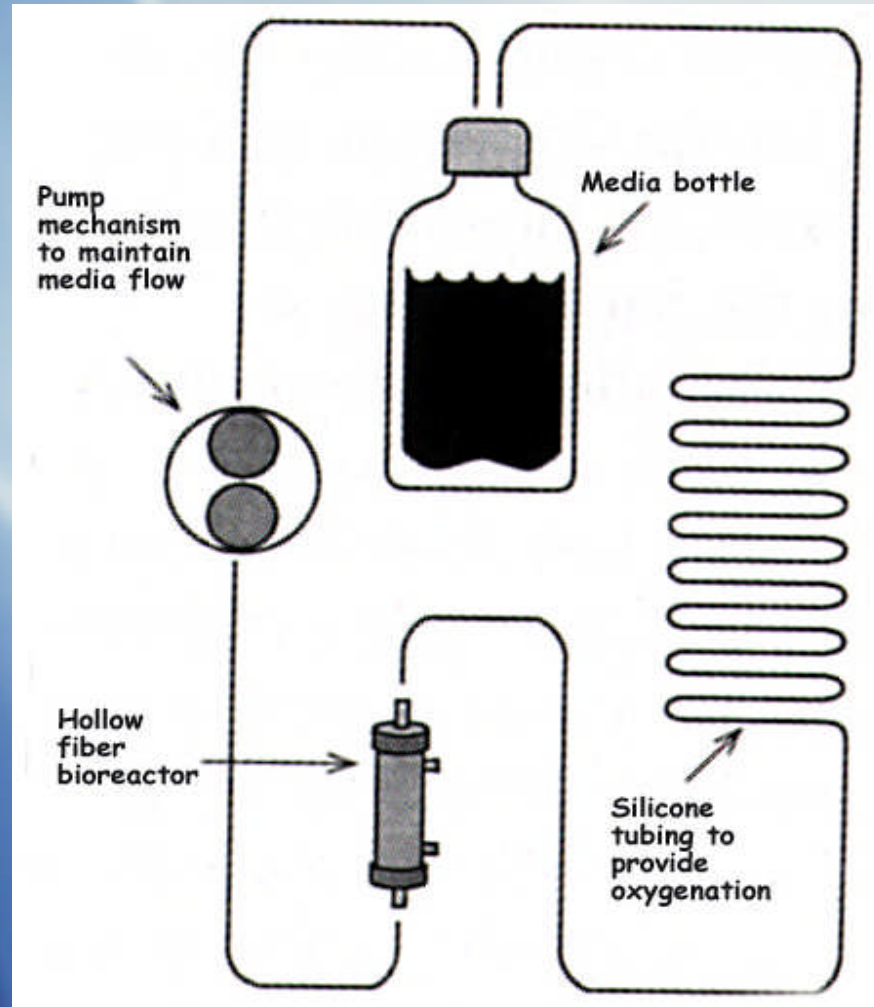
Gas Permeable Bag



In vitro replacement for mouse hybridoma or ascites fluid for monoclonal antibody production.



Hollow fiber bioreactor schematic



Used to produce monoclonal antibodies.



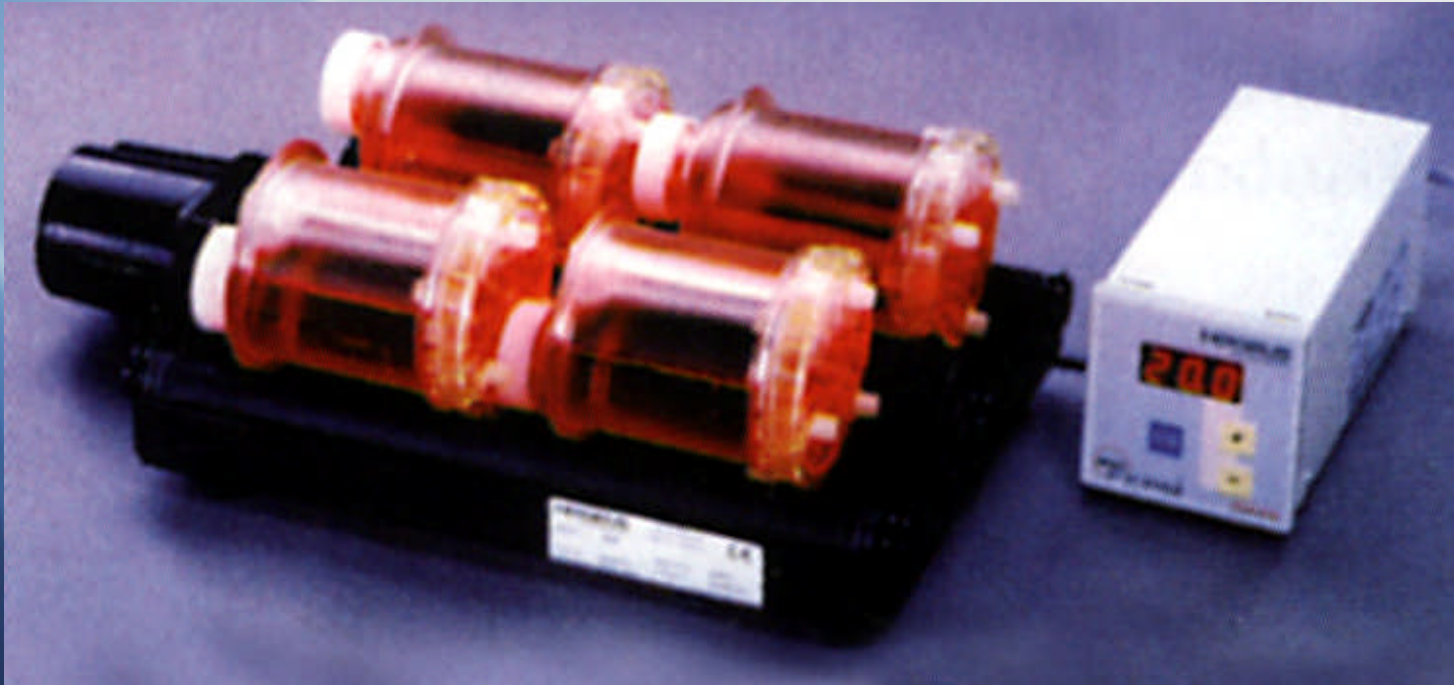
Miniperm Bioreactor



Single unit used to
produce monoclonal
antibodies



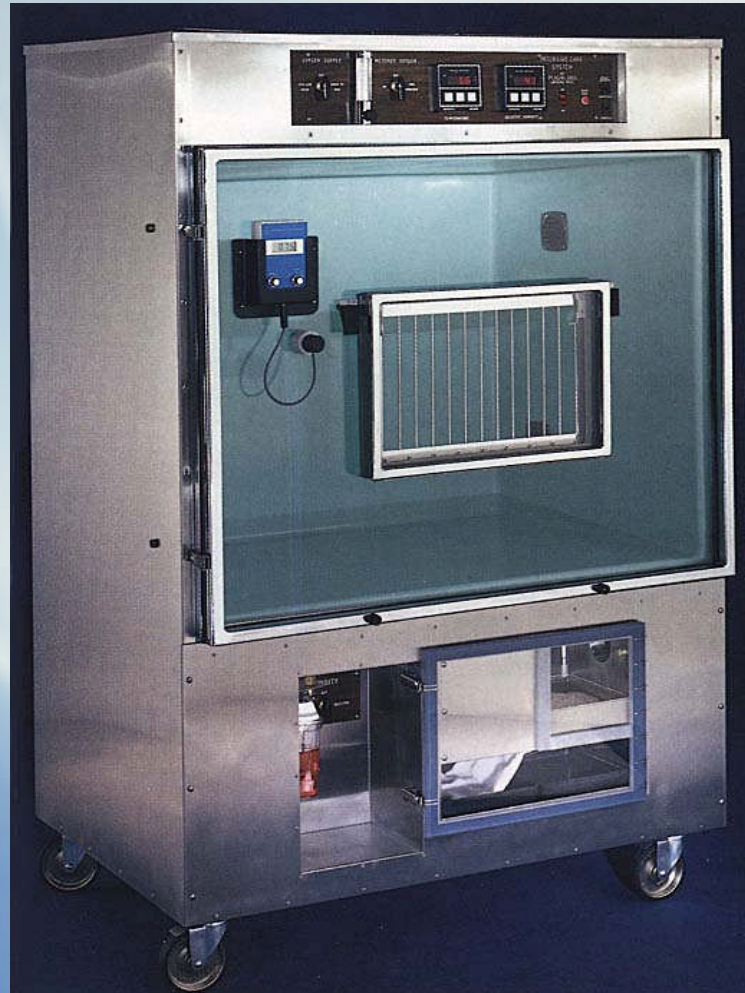
Miniperm Bioreactor



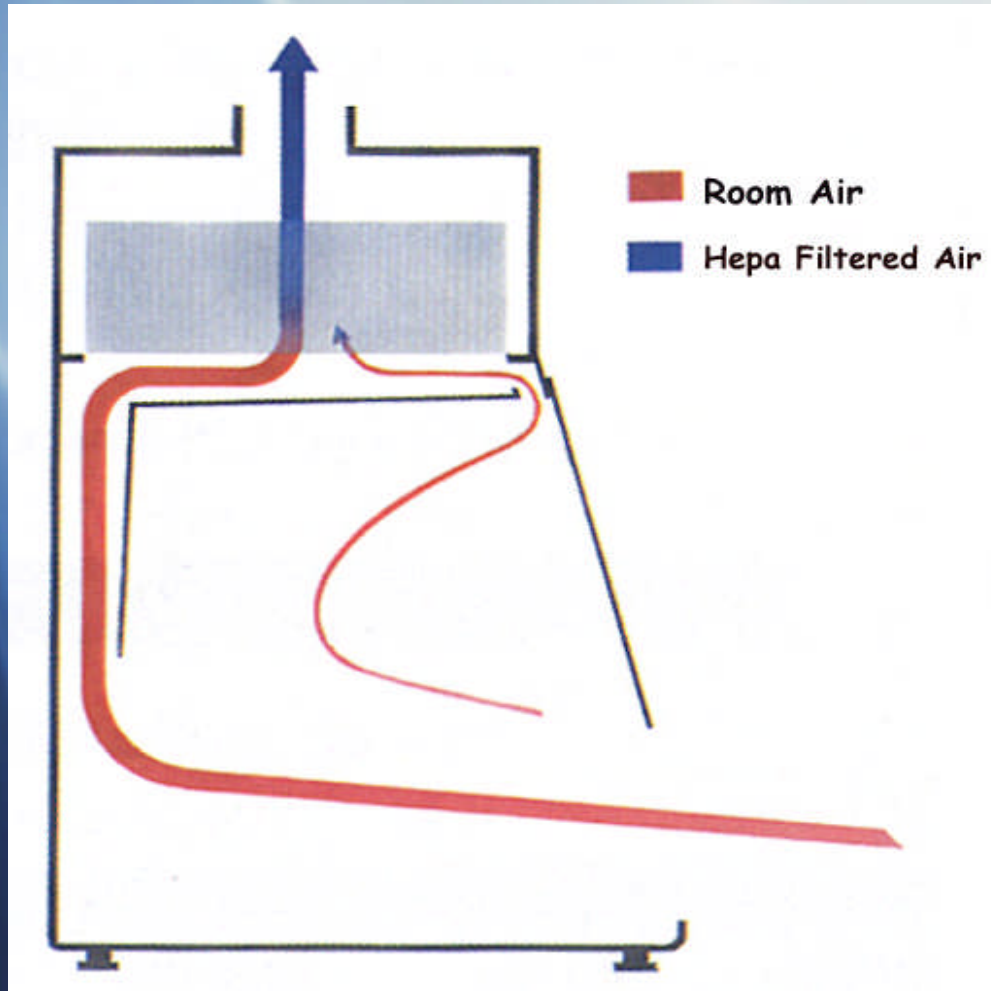
- 4 units w/ a remote control unit used to produce monoclonal antibodies



Intensive Care Unit / Critical Care Unit



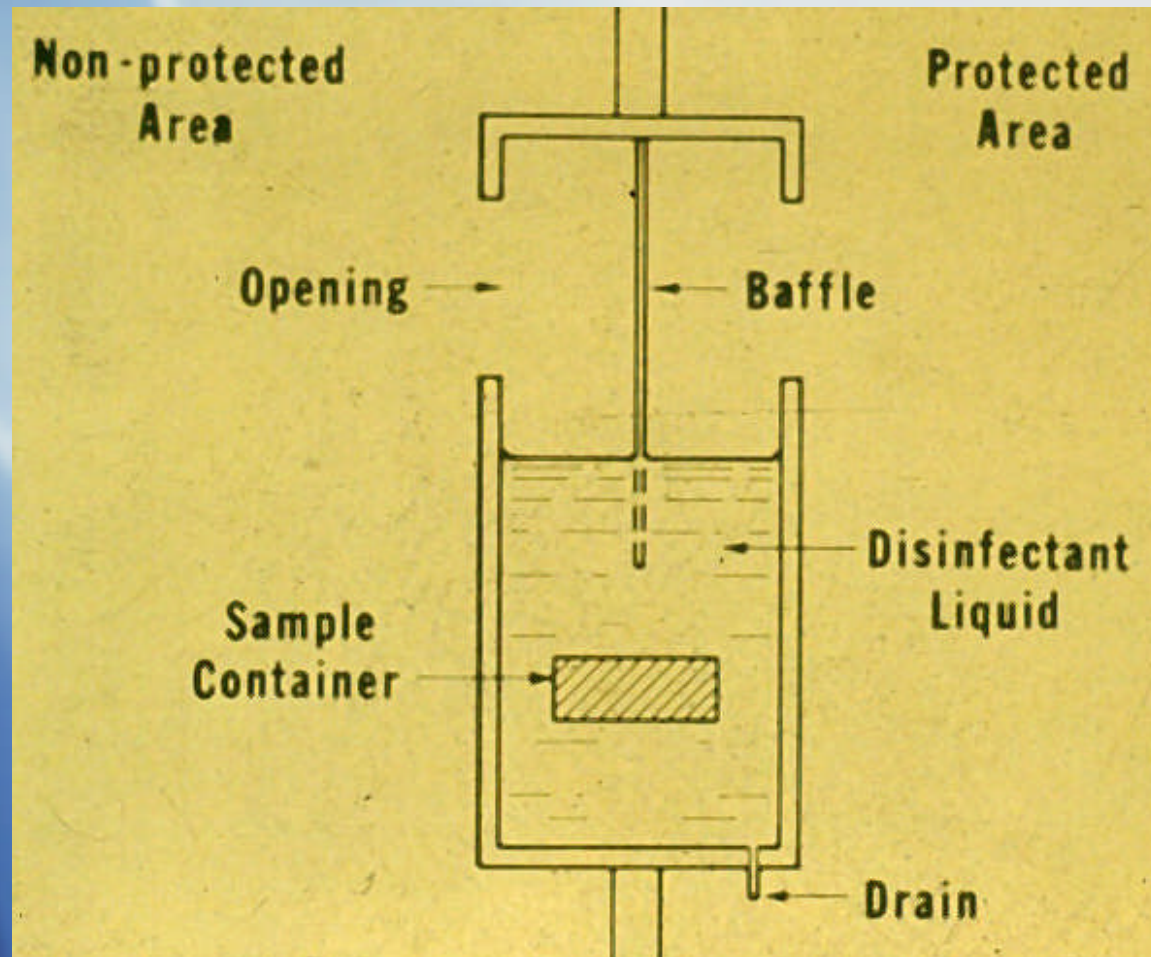
Class I Biological Safety Cabinet



Provides protection from agents potentially harmful to personnel and the environment.



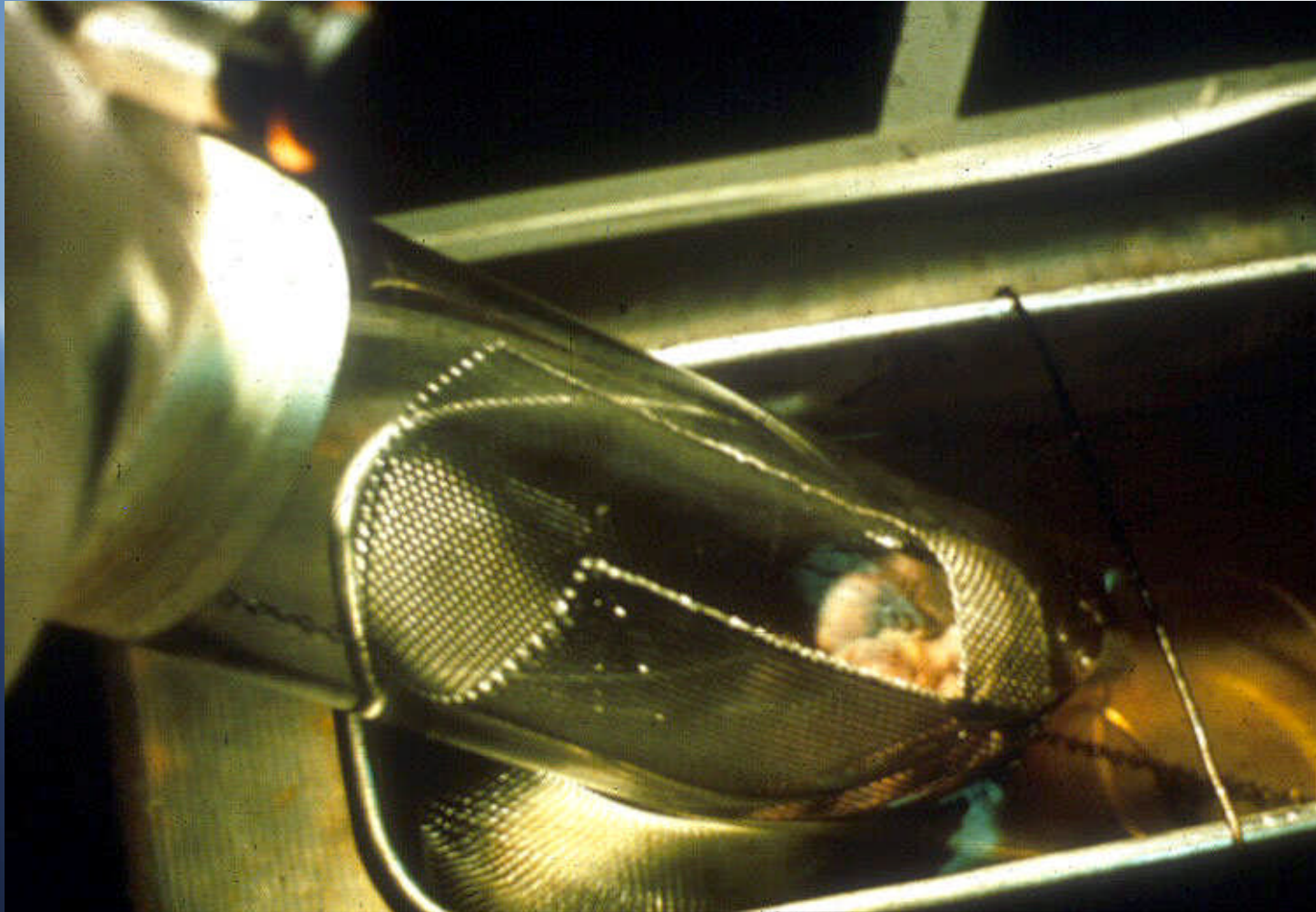
Disinfectant Dunk Tank schematic



Clamped Uterus



Pan tube transfer



Chain mail glove



Used to protect hand from scalpel blade cuts during necropsy or for small animal handling.



Leather hood and sleeves



Attaches to leather gauntlets to offer protection from bites/scratches when hand-catching nonhuman primates.



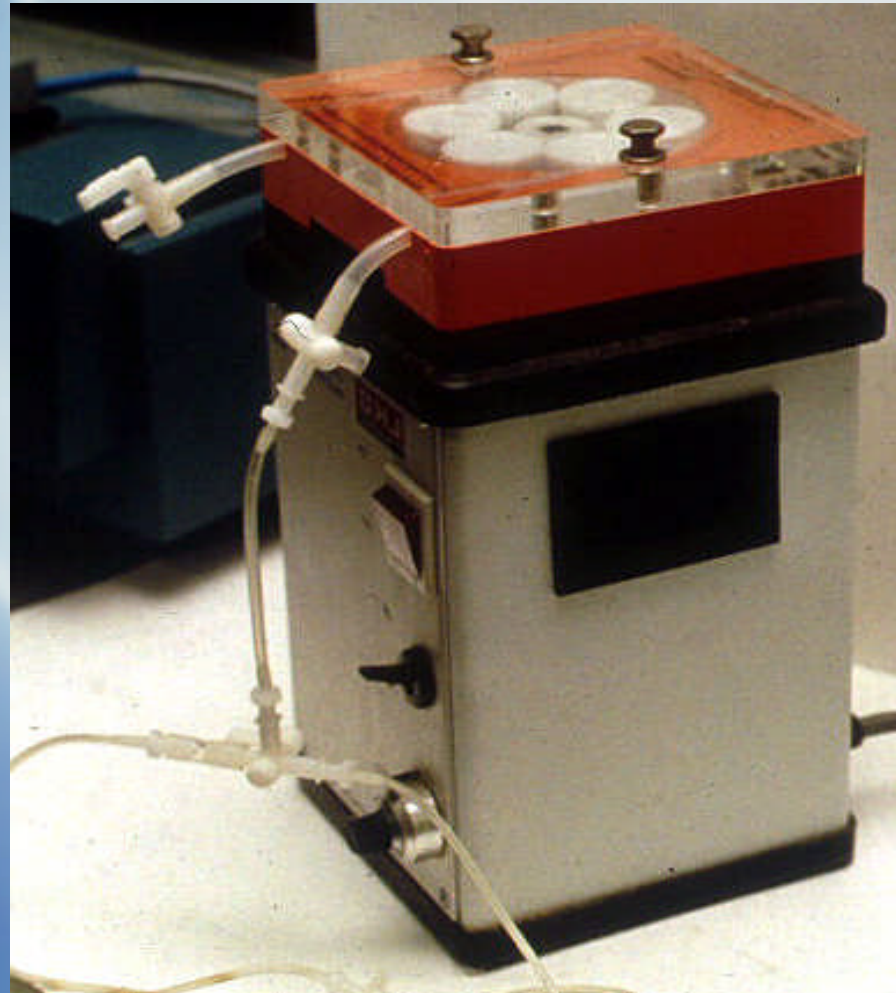
Syringe Pump / Infusion Pump



Used to deliver precise infusion rates.



Peristaltic Pump



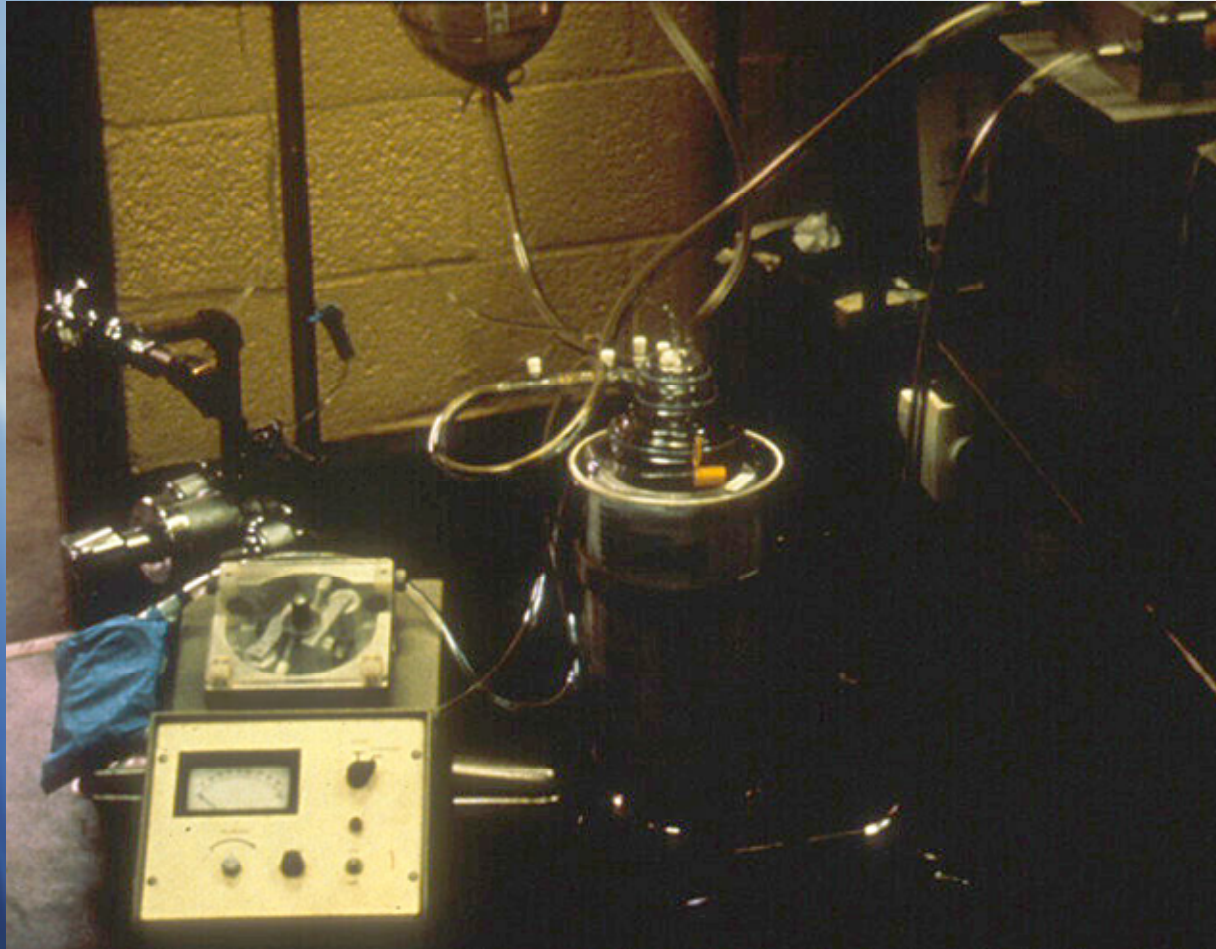
Peristaltic Pump



Multiple Syringe Pump



Heart lung bypass machine



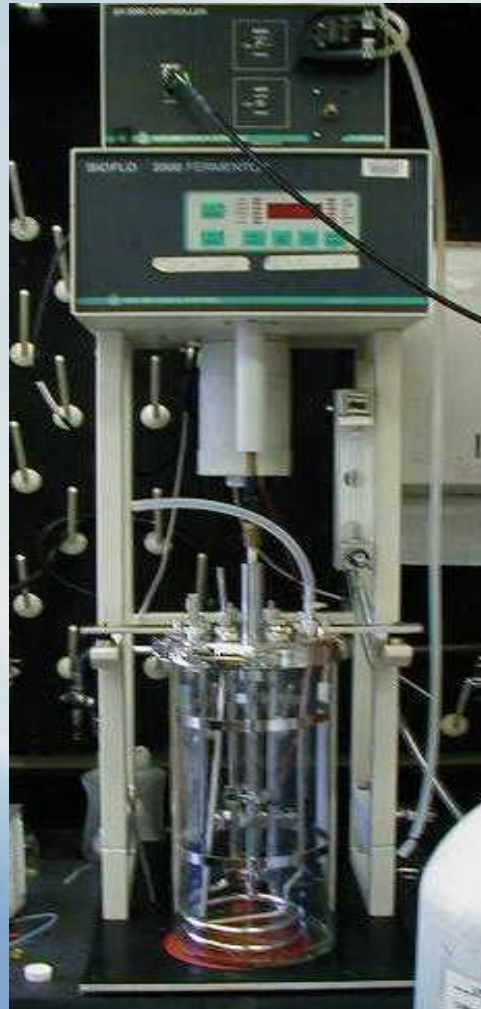
Continuous Arterio-Venous Oxygen Difference Analyzer (A-VOX):



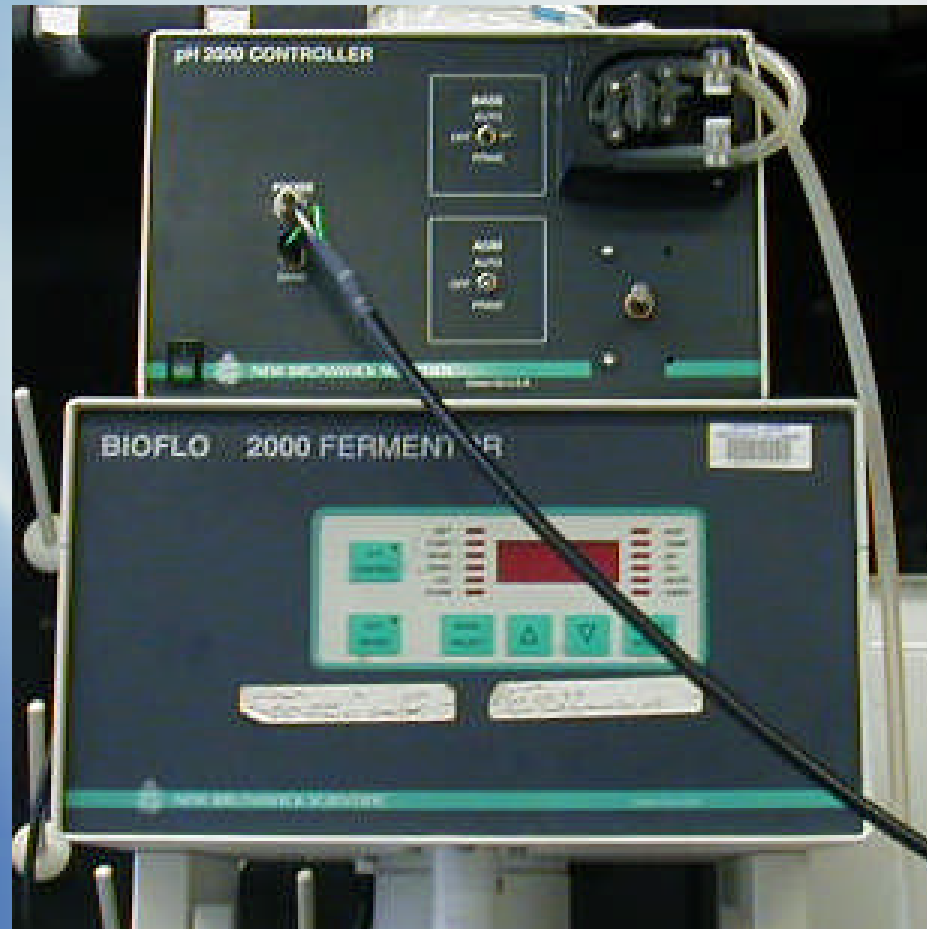
Apparatus to allow multiple microdialysis & intravenous infusions



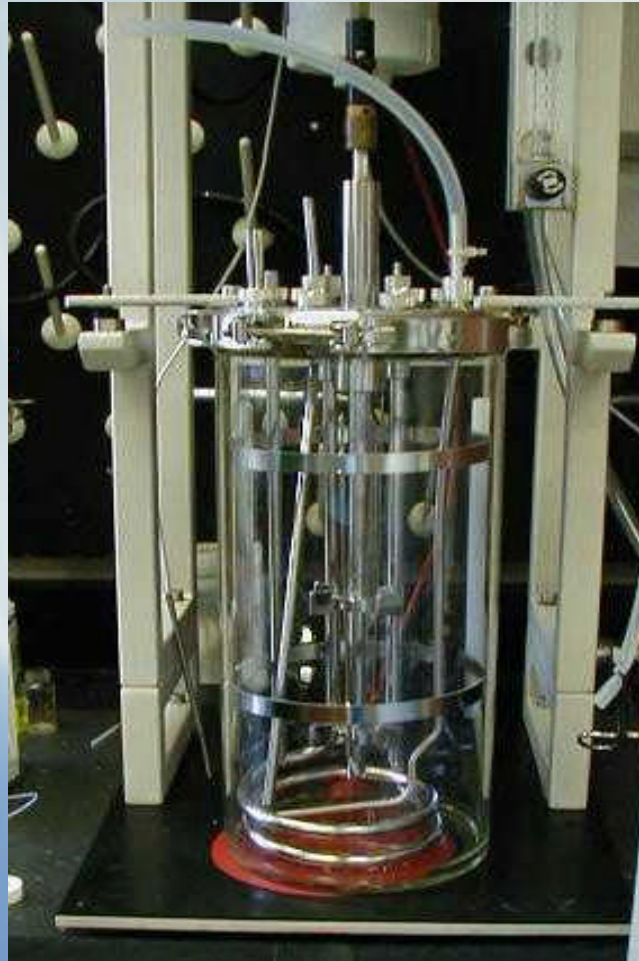
Bacterial Fermentor



Bacterial fermentor (close-up of top):



Bacterial fermentor (close-up of chamber)



Centrifuge Rotor Head



Microcentrifuge



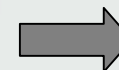
Tabletop Centrifuge



RC-5 Superspeed refrigerated Centrifuge (closed)



RC-5 Superspeed Refrigerated Centrifuge (open):



Nylon Ear Tag



- **What method of identification does this depict?**

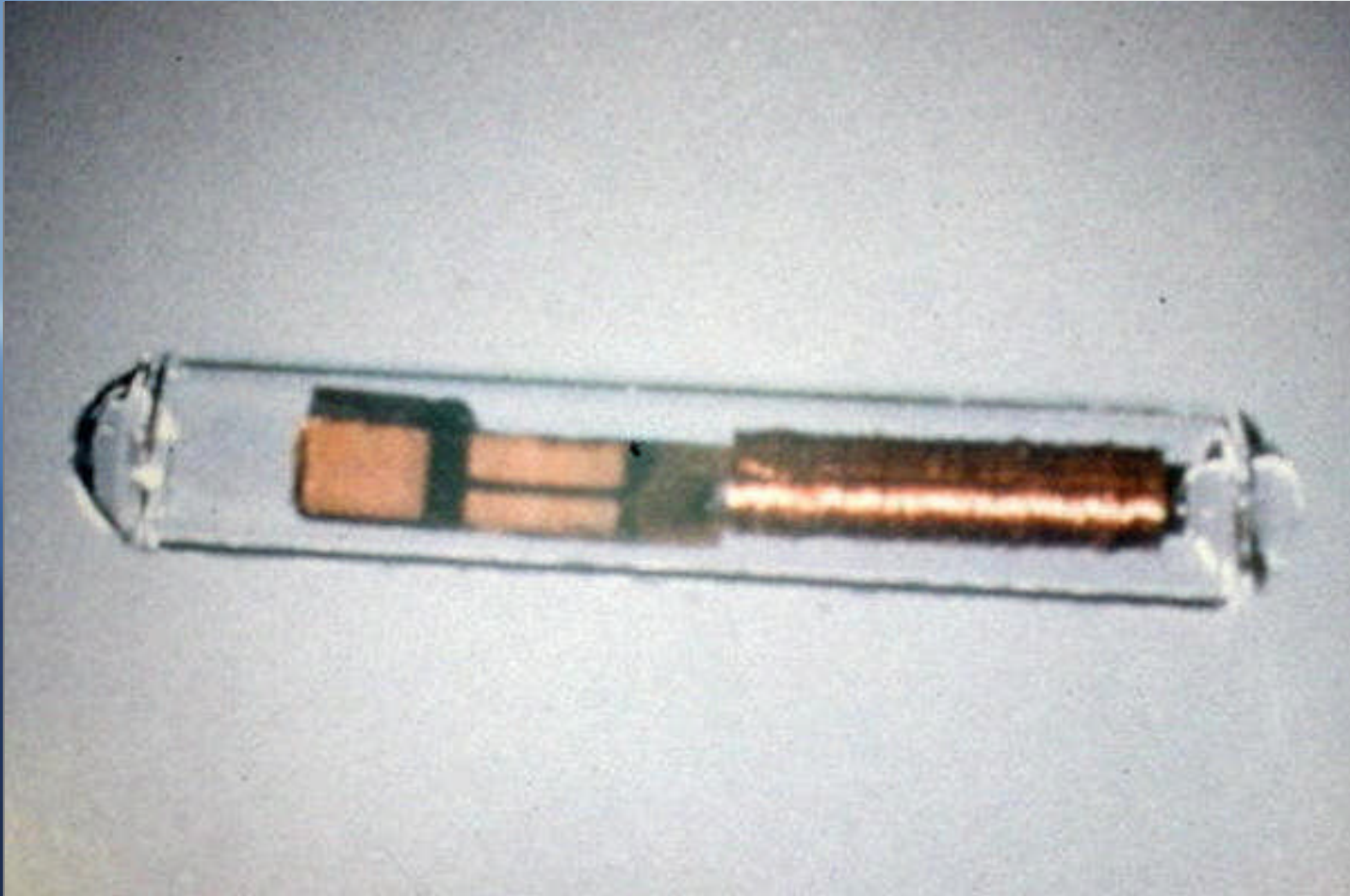
In what species is it used?

Nylon Ear Tags for Individual Identification of Guinea Pigs

- **What advantage does it have?**

Less loss and more benign tissue reaction

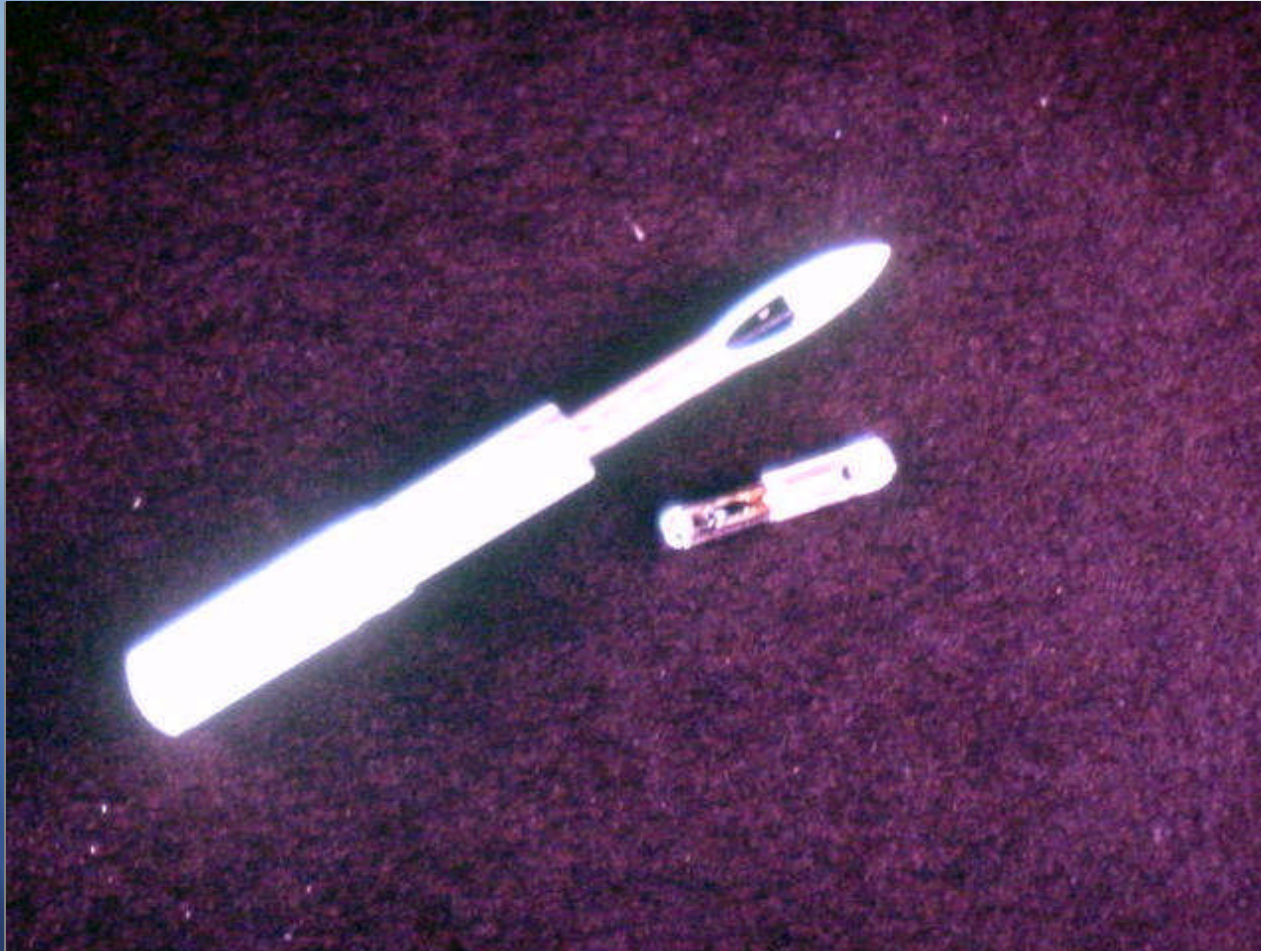
RFID Microchip



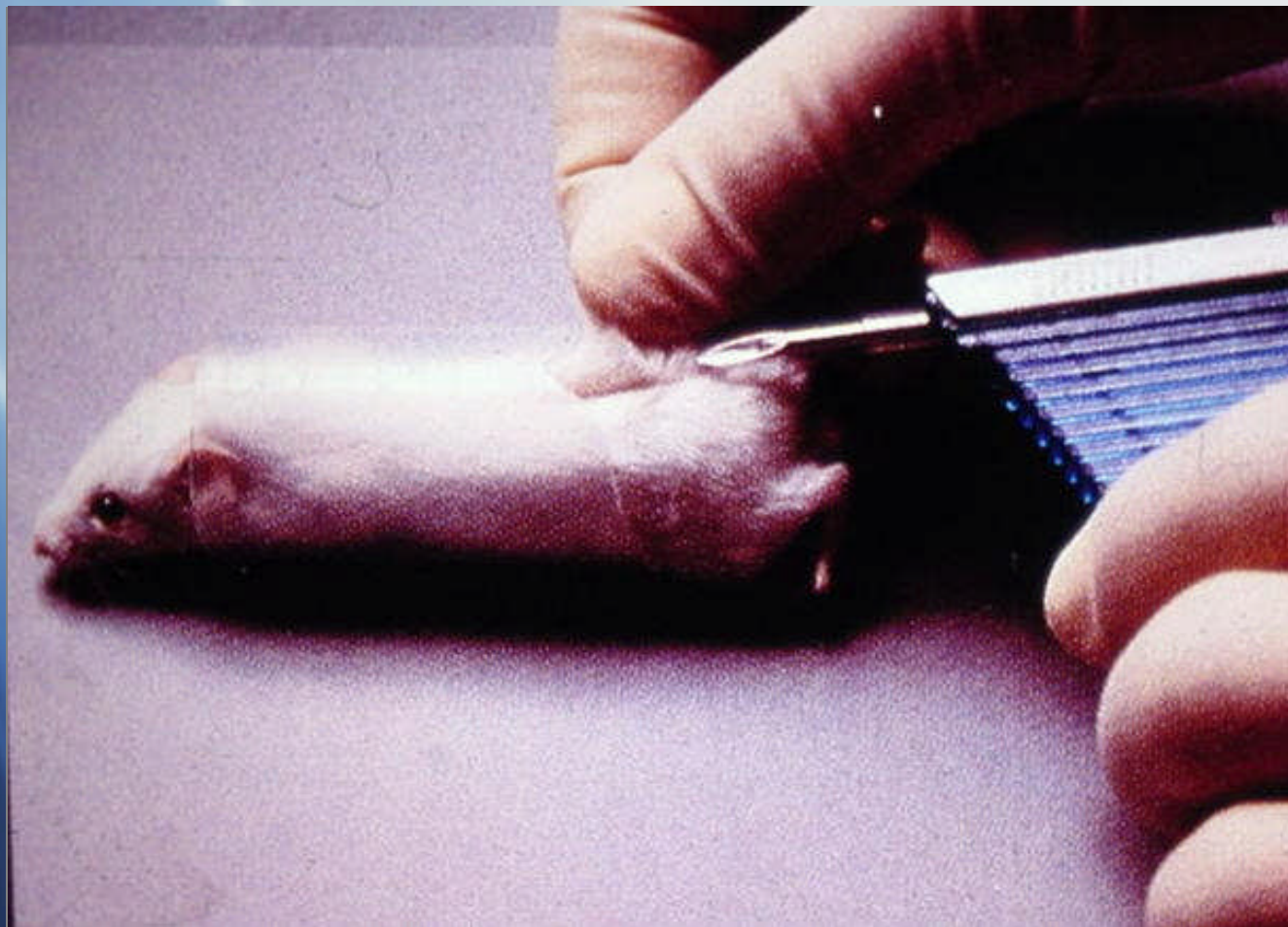
Radio Frequency Identification



Needle and microchip



Placement of microchip

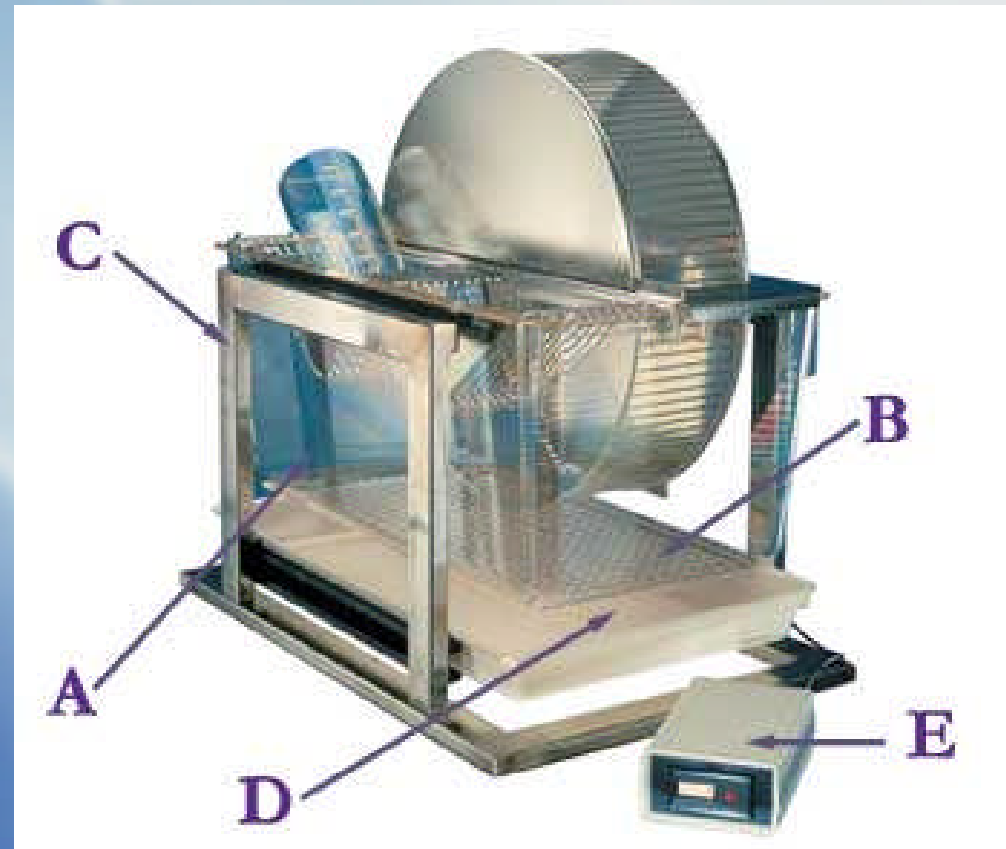


Wand, ELAMS

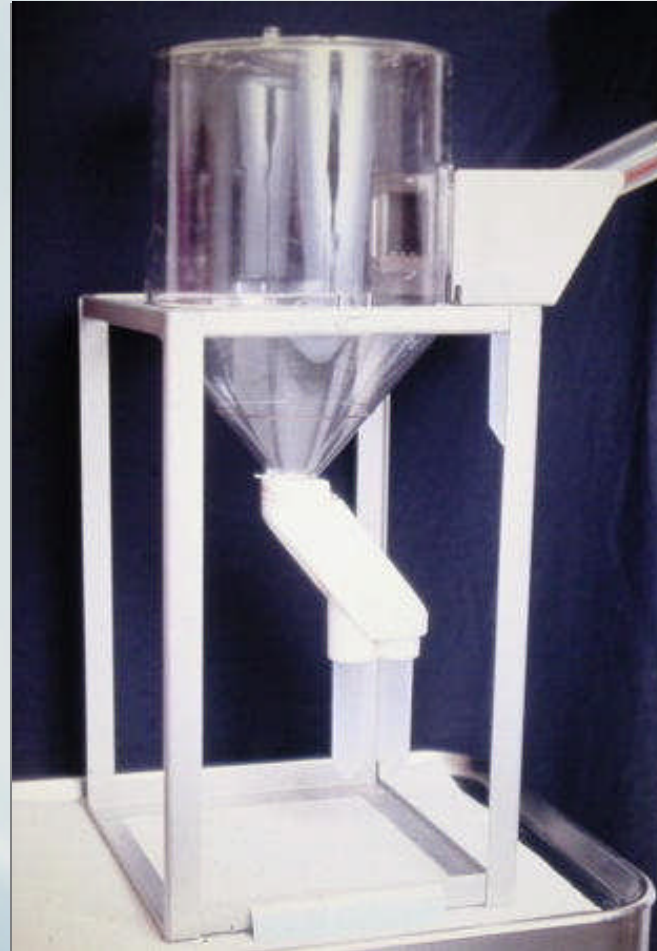
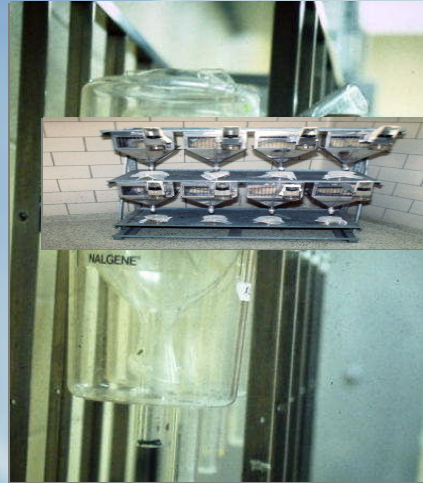
Electronic lab animal monitoring system



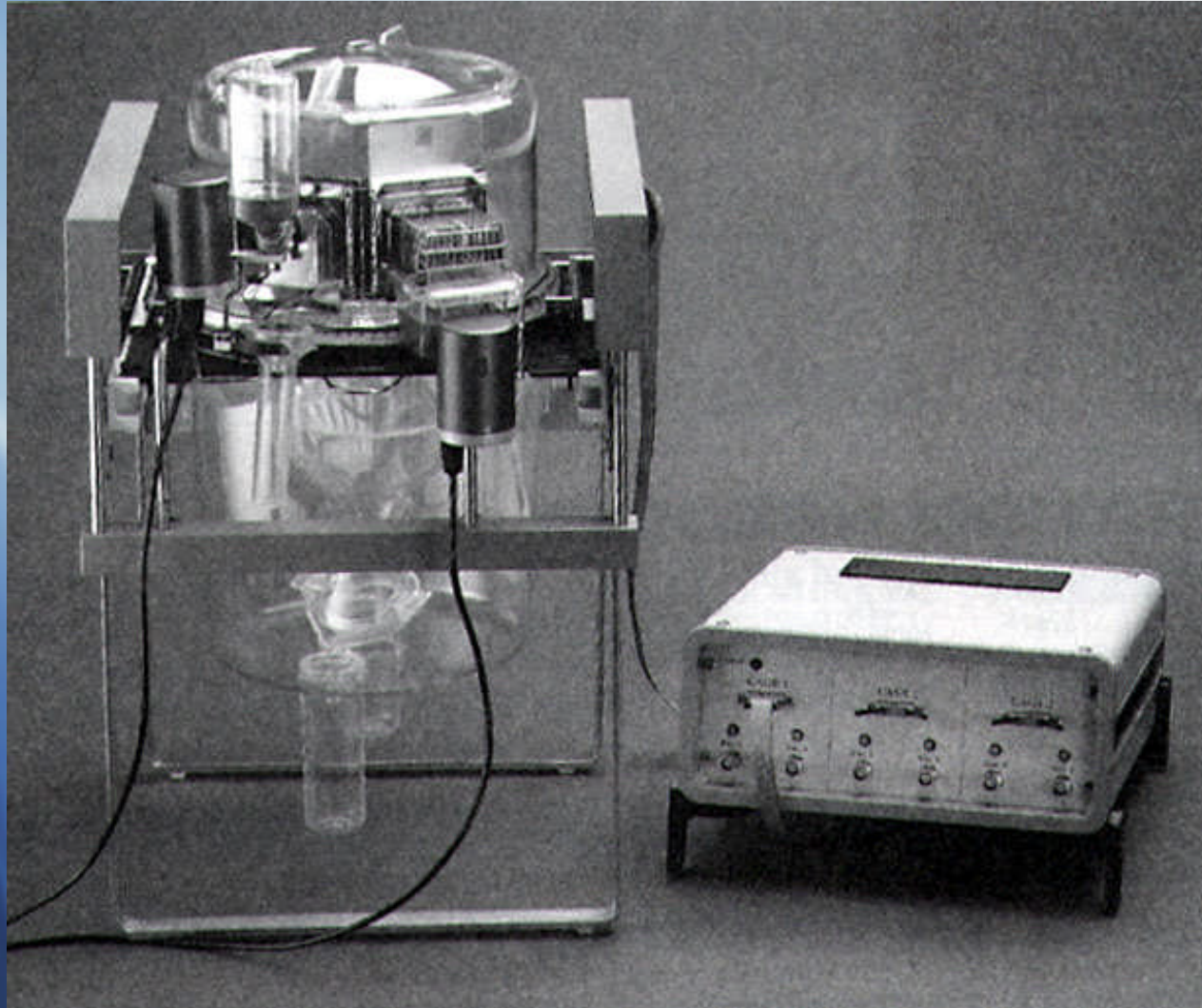
Rodent Running Wheel Cage



Metabolic cages



Activity & Metabolism Cage



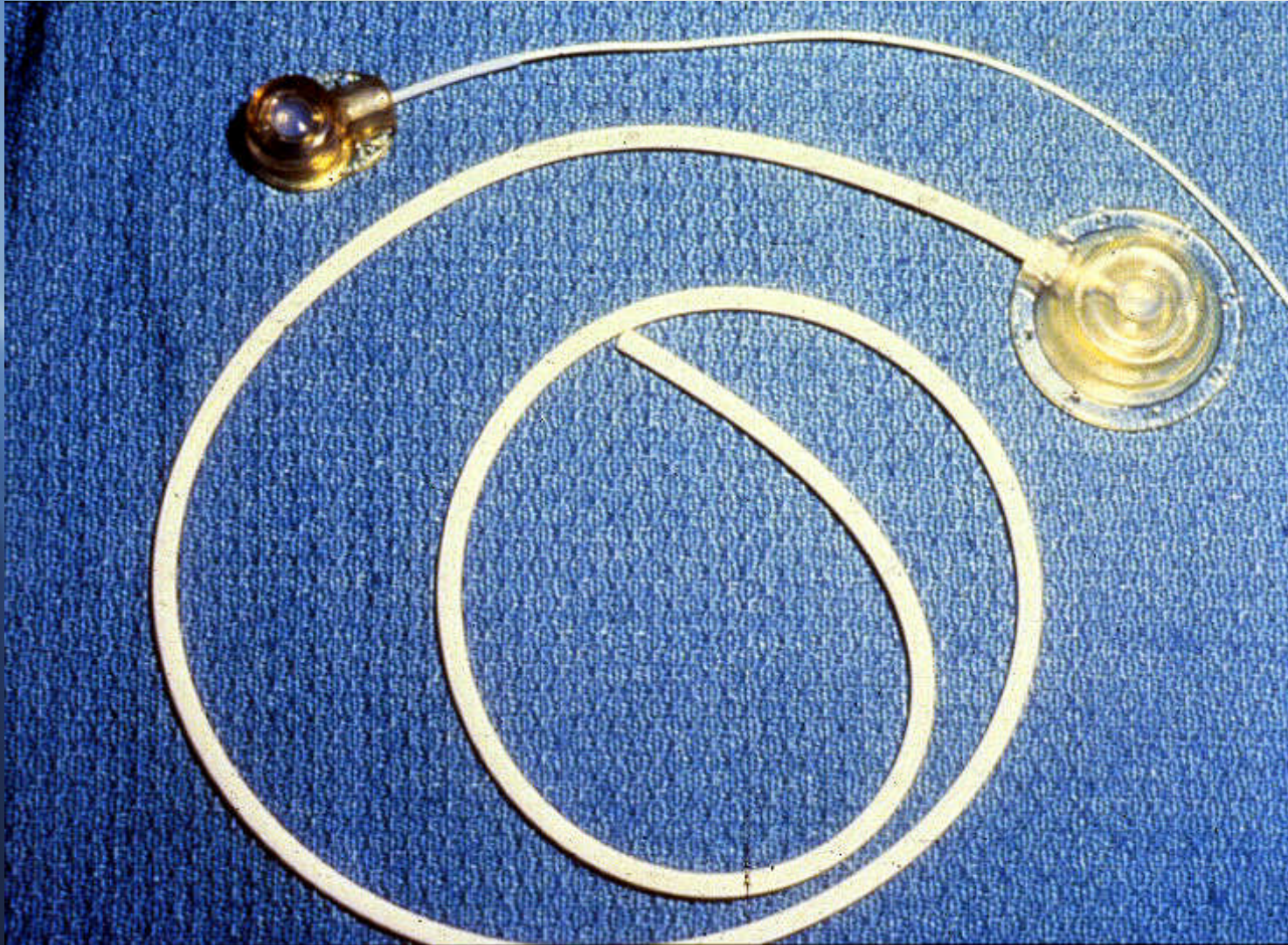
Metabolic Stanchion



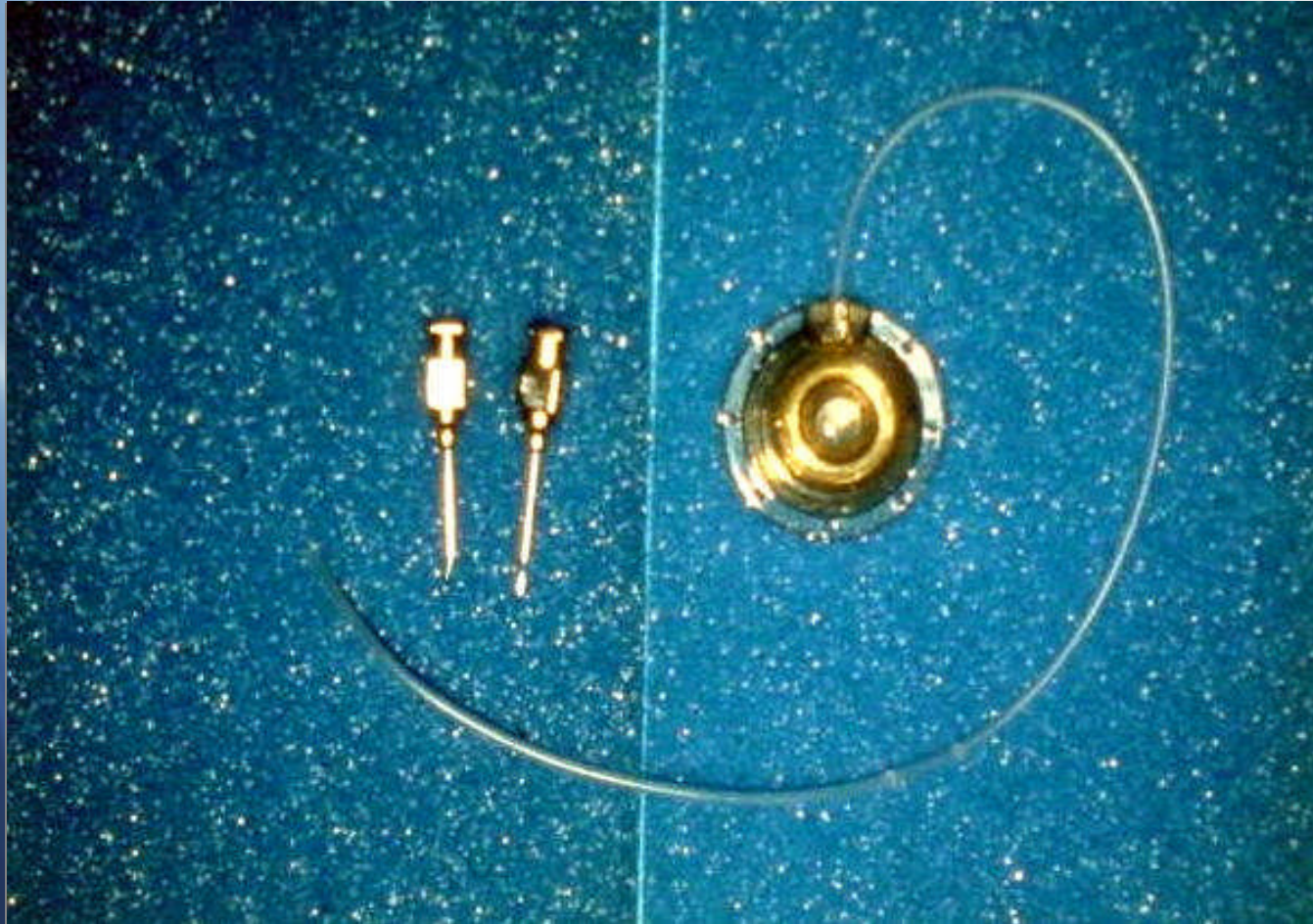
Firefly ATP Monitor



Vascular Access Ports



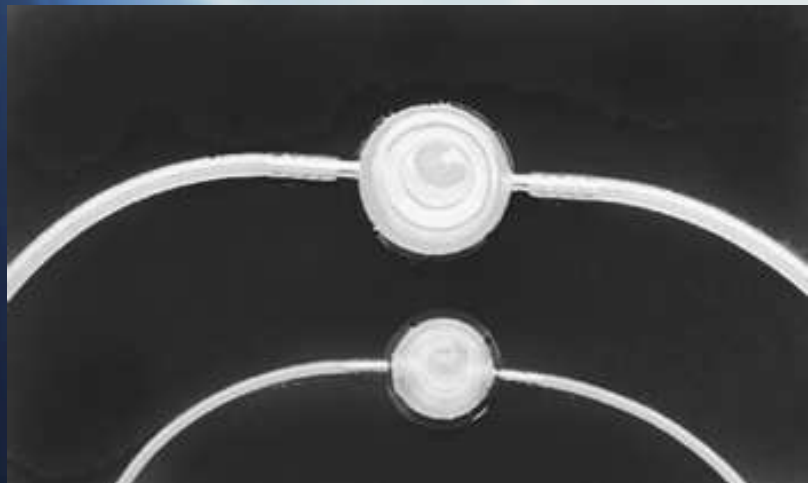
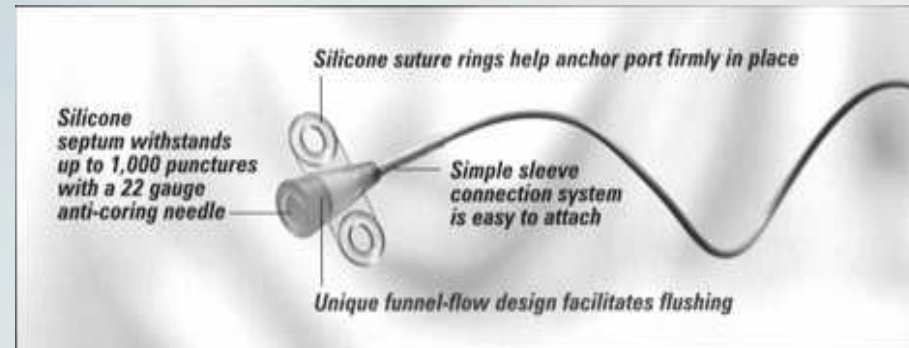
Vascular Access Port



Huber point needle and infusion set



Other Vascular Access Ports



Free standing positive (bioBubble) clean room



HEPA Filter/Blower



Germ free shipper



Flexible film isolators



Handling of NHP via pole and collar



Primate Restraint Chair



Class II Biosafety Cabinet

