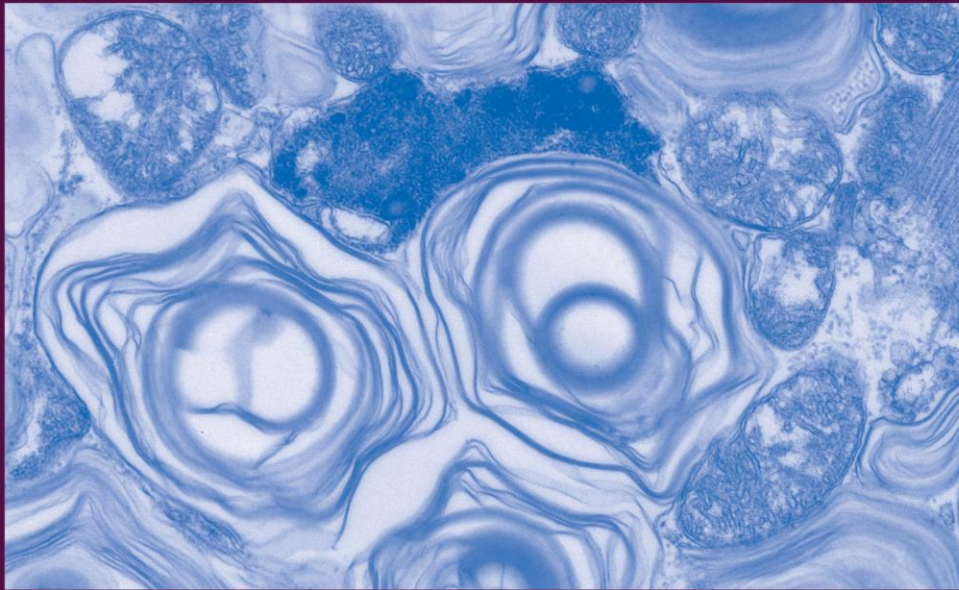


Ghadially's Ultrastructural Pathology of the Cell and Matrix

Fifth Edition



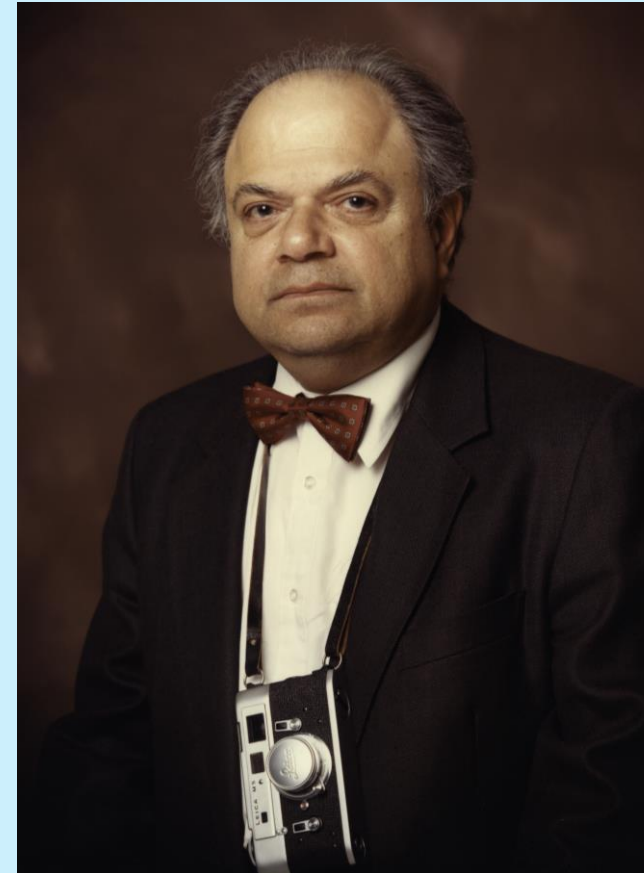
EDITED BY BART WAGNER AND JOHN STIRLING
ASSOCIATE EDITORS: LUCY COLLINSON AND ALANA BURRELL

FNG



CRC Press
Taylor & Francis Group

Feroze Novroji Ghadially



MB BS (Bom), MB BS (Lond.), MD, PhD,

**DSc (Lond), FRC Path, FRCP(C), FRSA, Isaak Walton
Killam Laureate of the Canada Council,**

**William Boyd Lecturer of the Canadian Association of
Pathologists, W.S. Lindsay Professor of the College of
Medicine.**

Prof. Ruby Ghadially

**MBChB (Univ. Sheffield, England), FRCP(C)Derm
(Toronto, Canada), FAAD**

**Dept. of Dermatology, University of California, San
Francisco, Co-Director of the Epithelial Section of the
Broad Center for Stem Cell Research**

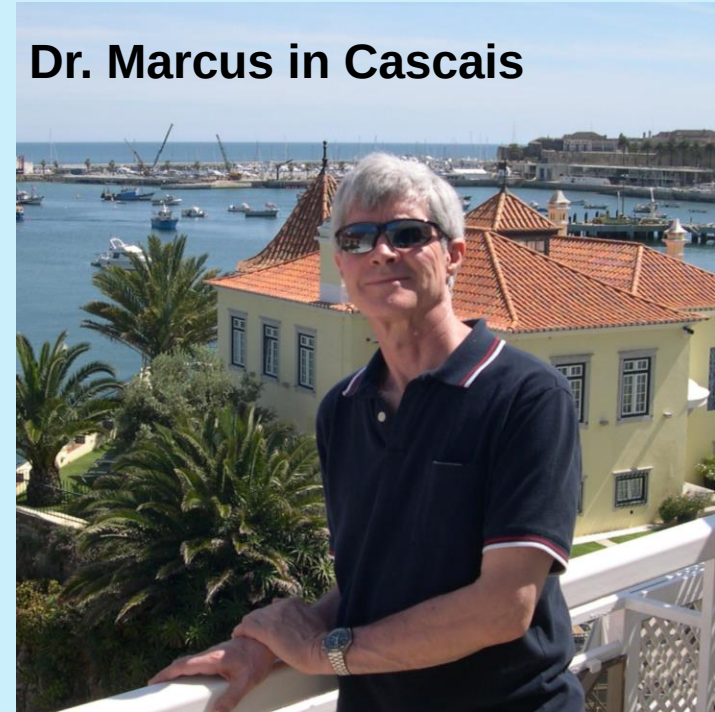
Clinical dermatologist/ basic science research in epidermal stem cell biology

***FRSA (British) awarded to individuals who have demonstrated significant contributions to
social progress and development, particularly in the area of the arts.**

Based on *Feroze Novroji Ghadially, 1920–2014: a personal remembrance* – Peter B. Marcus (1942-2017)

Baylor Health. In Dallas Texas

Dr. Marcus in Cascais

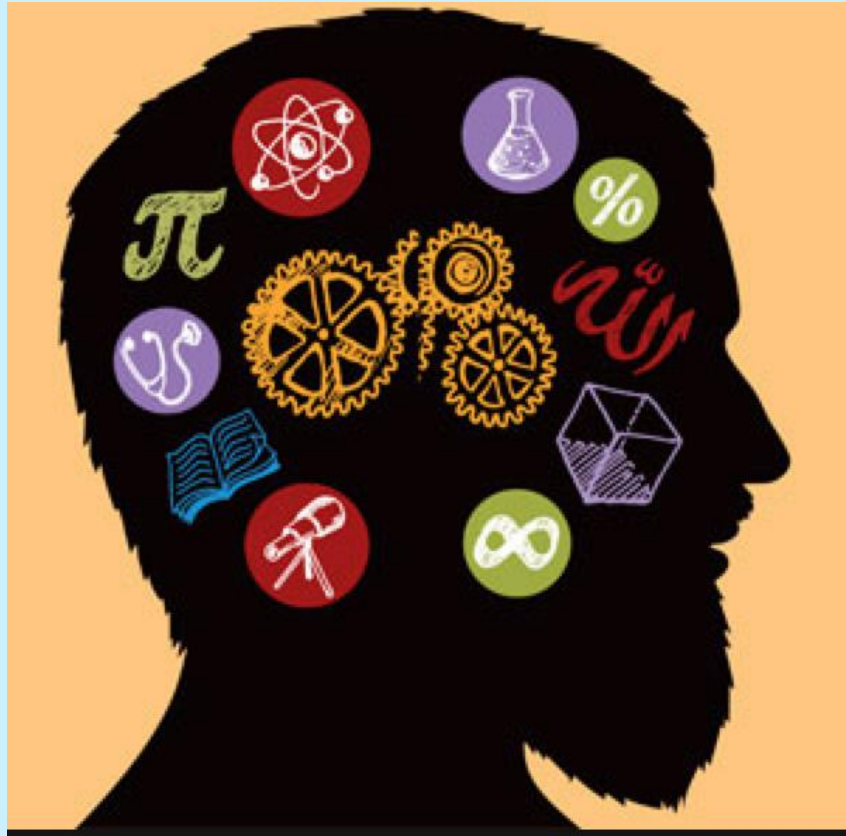


Peter B. Marcus wrote “Dr. Ghadially was one of a small group of gifted teachers who made pathology come excitingly alive for me. Two others who made an enormous impact on my pathology career were John Frost and Bernard Ackerman. These two giants of the pathology world shared with Dr. Ghadially the unique ability to bring scintillating clarity to complex and confusing subjects”.

My father's colleagues and friends all tell me that he was a great teacher and speaker, and an amazing character.

He was a great student – something I observed.

Great teacher: Great student



I AM A STUDENT OF EVERYTHING. I LEARN FROM THE WORLD AROUND ME. I STUDY THE MATH OF THE UNIVERSE, THE ART OF LIFE, AND THE WORKING OF NATURE. I PONDER THE REASONS BEHIND EXISTENCE. I STARE UP AT THE NIGHT SKY AND AM AMAZED AT THE VASTNESS OF WHAT IS. I LEARN FROM EVERYONE I MEET AND ANYONE WHO WILL TEACH ME. I INVENT, I CREATE, AND I BUILD. I AM NOT DEFINED BY MY CAREER OR JOB OR DEGREE. I AM MORE THAN THAT. I WILL NOT BE ONE THING; I WILL BE EVERYTHING. I AM A **POLYMATH**

Polymath (renaissance man)

Invent, create, build, not defined by career

A side of FNG many of his work colleagues never saw – a student of:

Early years	Telescopes Music/ violin
Middle life	Pathology Fish Orchids Music Sculpting Photography
Later years	Investing Nicotine

Zoroastrian background gives insights into his personality.

Zoroastrianism: an ancient pre-Islamic religion of Iran

Still survives in Iran in isolated areas but more in India.

Islām were victorious in Persia (now Iran) in 635 AD.

Zoroastrians survived as a persecuted minority.

From the 10th century onward, Zoroastrians emigrated to India.

Agriculturists originally. Became a prosperous and “modern” community in Mumbai. Ghadially – “watchmaker”

Initially they adopted the language (Gujarati) and dress of the Hindus. Later adopted British customs: dress, education of girls, abolition of child marriage.

Zoroastrian morality = "good thoughts, good words, good deeds"

Worship fire as a symbol of the illuminated mind.

Not very concerned with theology: One God. No devil per se.

Only 200,000 Zoroastrians/ Parsis remain.

FNG - most a moral person - religiously atheist. *



‘Rebellious’

Mumbai in 1920

Father was an engineer, Mother artist,

Sister pianist and professor of English literature

Nothing went smoothly...

Birth not registered...

Difficult time at school

**Daily canings - refused to accept what
was taught, religious dogma, rules**

Bullied – outsmarted his bullies.*

**Parents were asked to remove him
from the school**



At the next school (Masters High School) FNG encountered the textbook of Physics and Chemistry by Godfrey and Hodges.

He always told us, the excitement with which he read and reread this book and tried the experiments

Very proud of his successful making of gunpowder!”

74.8% saltpeter (potassium nitrate)

13.3% charcoal

11.9% sulfur (used to acidify soil)

It is actually quite easy. Excited by accomplishment? Or disturbance and mayhem he caused around himself?



All his extracurricular activities and reading led to him fail the matriculation examination for St Xavier's college, Bombay University in 1935 - passed in 1936.



By this point FNG had made up his mind to be a scientist

He took his MB BS (Bom) and then spent 3 more years to get his MB BS (Lond.)*

While in premed and medical school he became a student of:

Violin

Electronics

Radio communications

Leica (35 mm) photography.

Won awards for making Newtonian telescopes.

**Helped manufacturing and repairing scientific
instruments for laboratories.**

More about these later...

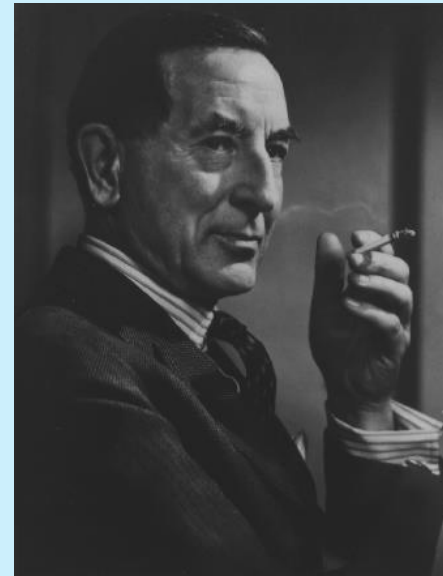
Failed his final M.B., B.S. examination.

Ironically, one of the subjects he failed was Pathology!

When he did open *Boyd's Textbook of Pathology*, he said he felt the same excitement he had felt when he had opened his first science textbook – He knew he was going to be an experimental pathologist.

Interesting that FNG became known for some of the same attributes that he admired so much in Willian Boyd.

**William Boyd - Born in Scotland
1883 – later moved to Canada
Famous for his readable style and
clinical examples**



**Edna May Bryant
Plymouth, Devon**



**They met while he was working on the
thesis for his medical degree at
St. Thomas's Hospital, London.**

**Edna received an academic scholarship to Oxford. Declined
– father refused to accept 'charity'. Librarian.**

Married in 1950

**Very qualified to become the one responsible for the
literature searches, references, and typing and retyping and
retyping of Ultrastructural pathology of the Cell and Matrix.**

**FNG obtained an MB BS, PhD Pathology, and DSc in London.
Relocated to Sheffield in 1953. For mouse cages and space.**



Sheffield University Firth Hall – Pathology Dept. - Electron microscope
Photo courtesy of Bart Wagner BSc FIBMS CSci

A student:

Fish and fish-keeping (>100 tanks)

Orchidology (large greenhouse)

**Sculpture – wood, stone, metal – home workshop +
Sheffield University**

Mosaics

Stained glass

Electronics

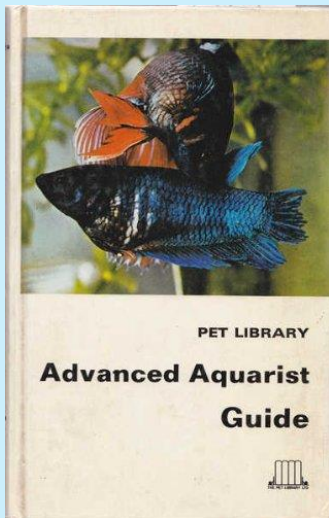
Photography

Pathology

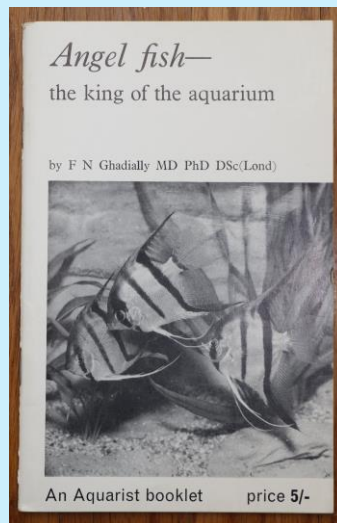


Student of tropical fish and fish-keeping

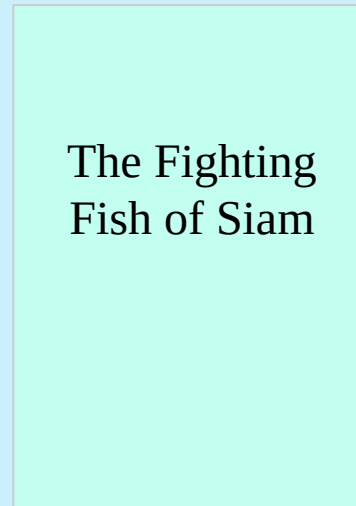
President of the British Aquarist Study Society,
He published 54 articles and 4 books on tropical fish.
Won many awards at aquarist society meetings.
1960-1980 traveled widely to lecture on this subject.*



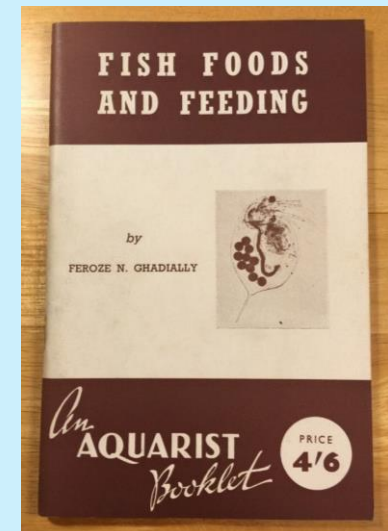
1969 (292pgs)



1968 (42 pgs)



1963 (34 pgs)



1957 (99 pgs)

Student of Photography

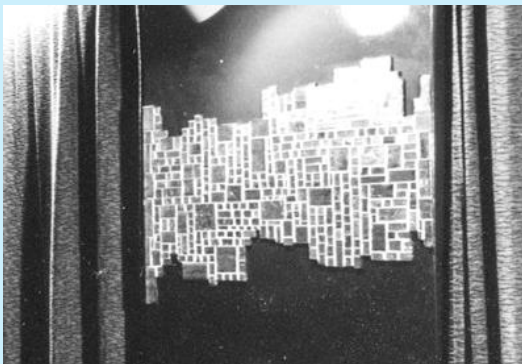
Cine World Contest Three Star Award. Film "Breeding the Brown Acara". Televised by B.B.C., 1954.

A film he made of kissing fish (a species of tropical fish, the Kissing Gouramis) was also shown on British television.

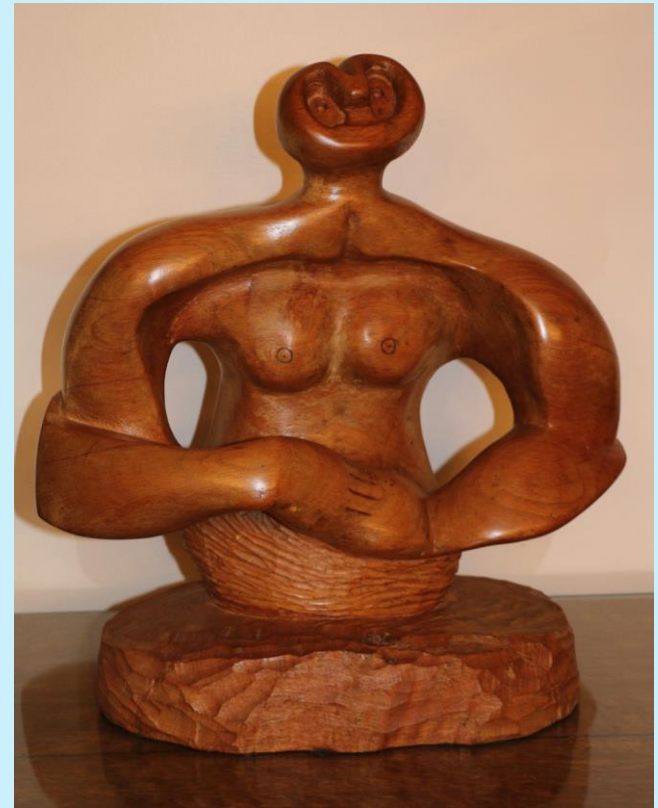


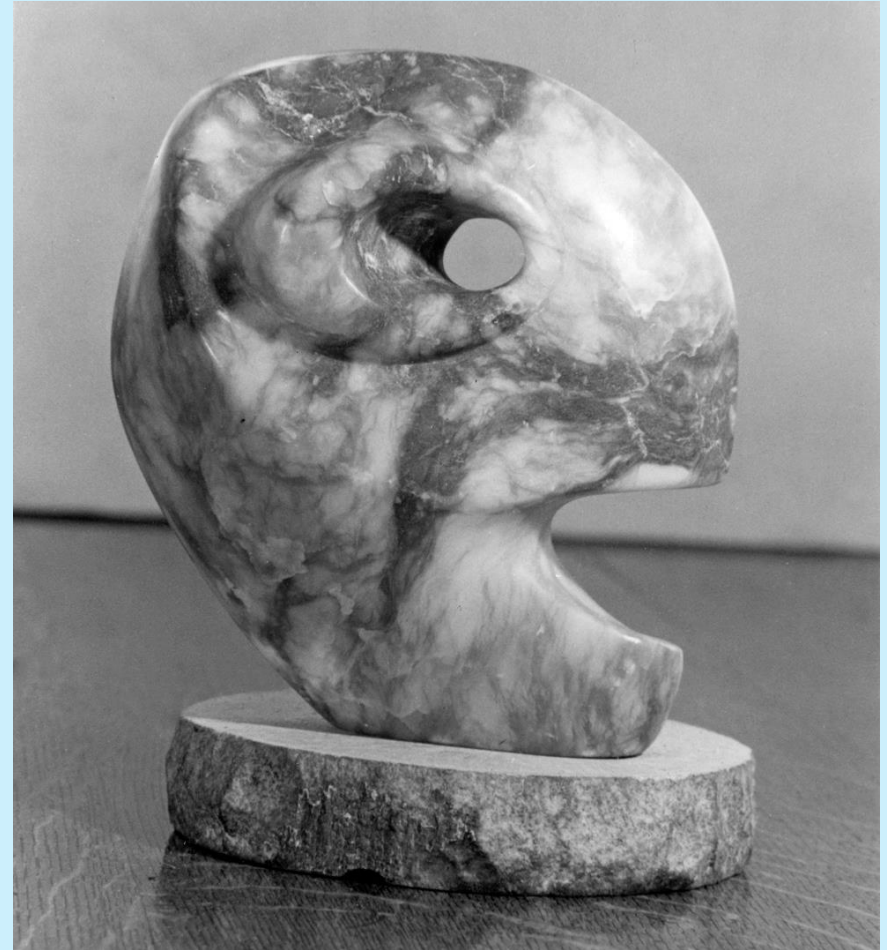
A student of art

Used the university workshop at Sheffield University and took up sculpting in wood, metal, and stone, won awards for stained glass, mosaics and sculpture.



Great admirer of Henry Moore and this is reflected in his style of wood sculptures.





FNG always saw the art in science – and this electron micrograph is a concrete (marble) example!

A student of photography

Age 17 - leica camera (1930s)

He did all his own photography for his books on orchids, on fish, on path.

Collected leica cameras

He developed and printed each and every plate for his books (focus, contrast, brightness!)

Children – developed and printed B&W at home

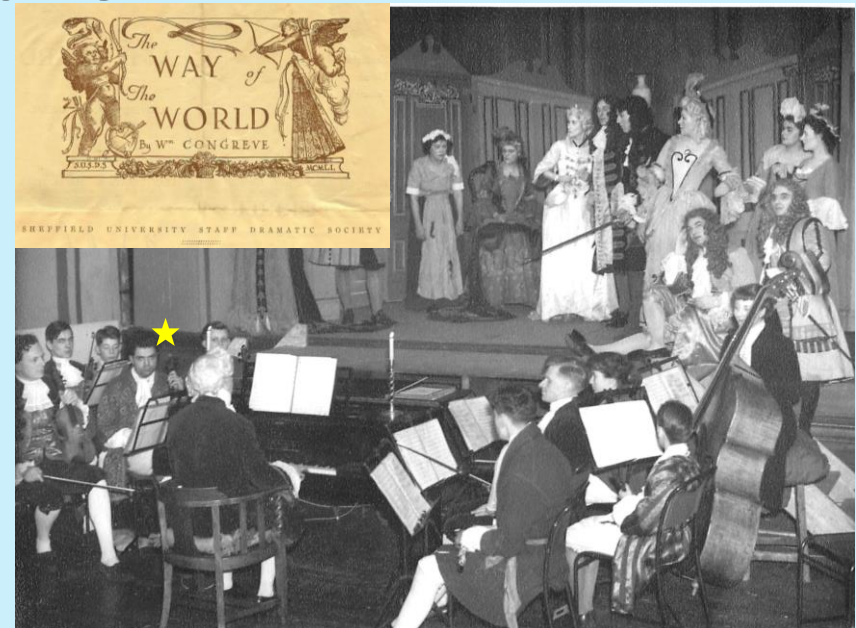


A student of music

Violin lessons from a student of Jascha Hefetz.

Feroze and Edna attended concerts in London each week. “cheap seats” right under the stage, but this was where FNG could study the soloist best.

FNG could identify even small excerpts from an extensive range of classical works.





Not the daily activities father!

Very non-sexist in his treatment of us

Very proud of being netball captain – “find a real challenge”

If you entered his world he was there:

Drive 150 miles e.o.w. to music lessons

Spent time helping in the dark room

Taught me to use wood chisels to make carvings

Took me on fungi foraging trips

A student of pathology

One may well wonder how he ever had time to study pathology!

In 1963 a patient left a large donation to Sheffield University for cancer research.

Pathology department purchased an electron microscope

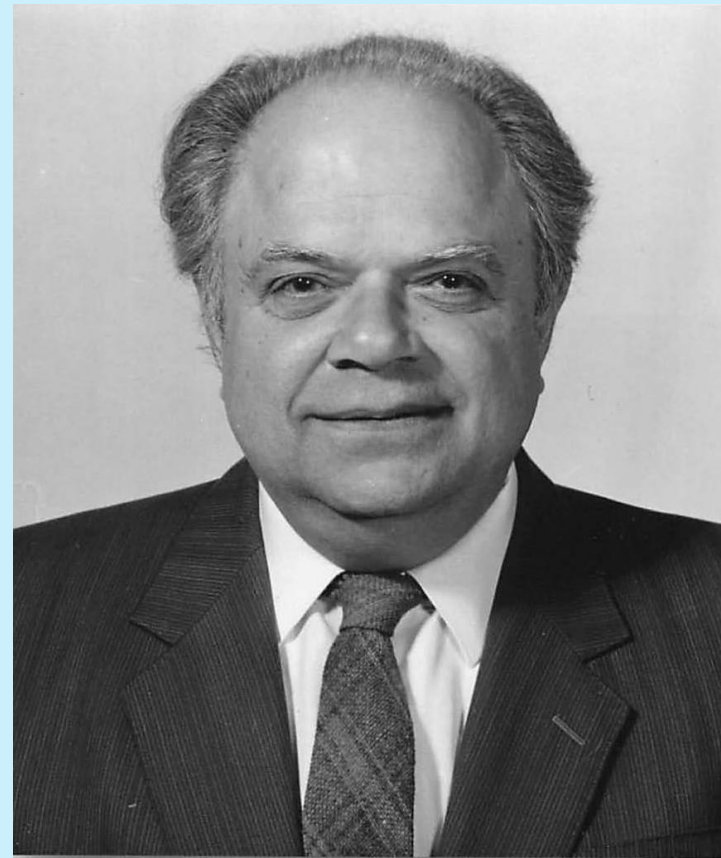
Nobody wanted the instrument or wanted to spend the time to use the complex technology associated with electron microscopy.

However, when the microscope was installed, FNG could not resist playing with it to see its capabilities.

The rest, as they say, is history!

5 years later (1968) – after spending many hours at the electron microscope, FNG accepted a position at the University of Saskatchewan in Canada.

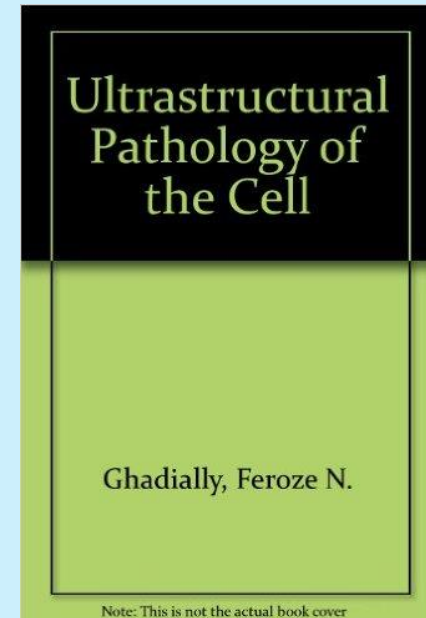
Mandate to develop and direct a laboratory for electron microscopy within the Department of Pathology.



Shortly after starting in Saskatoon in 1968, FNG found a new endeavor

“to study the vast variety of normal and pathological tissues and produce a book where just about everything that had ever been seen in the cell with the electron microscope would be catalogued, classified, illustrated, and explained.”

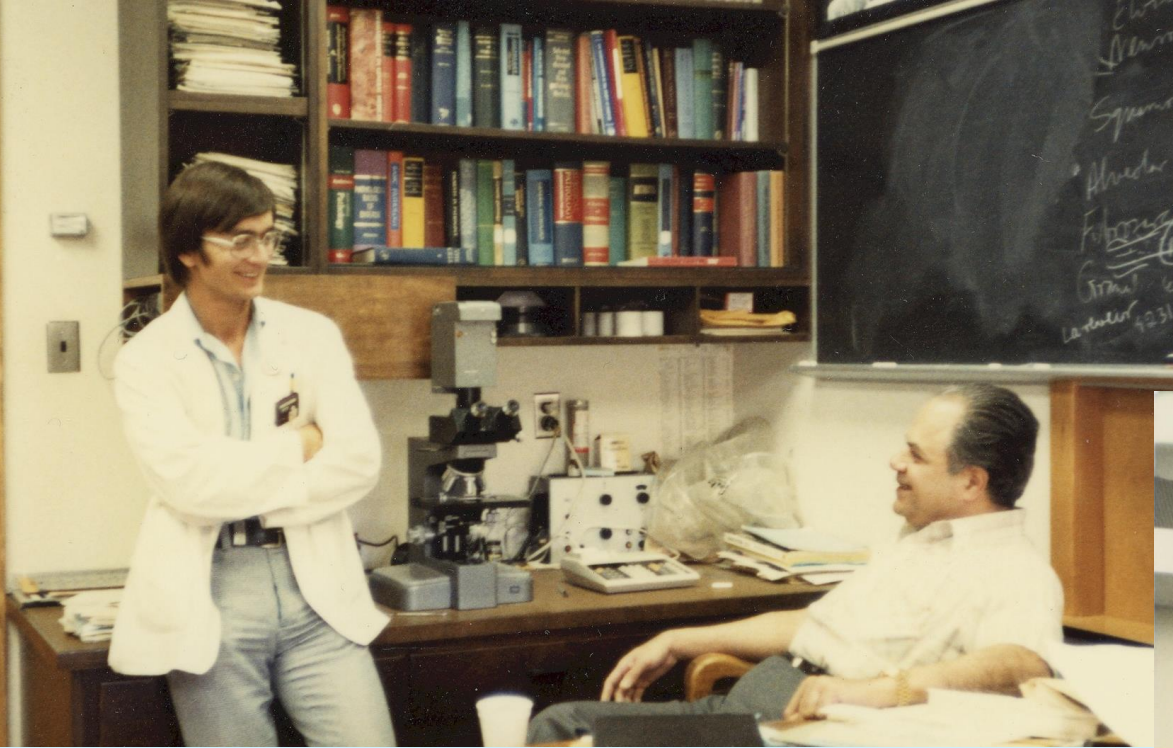
Some 6 years and 40,000 electron micrographs later, his book entitled *Ultrastructural Pathology of the Cell* was published (1975).





**Every photomicrograph in the book photographed, developed and printed by FNG
Every photomicrograph and every reference used was catalogued in binders,
color-coded by chapter, on shelves along the walls of his office.
As a consequence, for each paper I publish, there is a final binder with the all
references.**

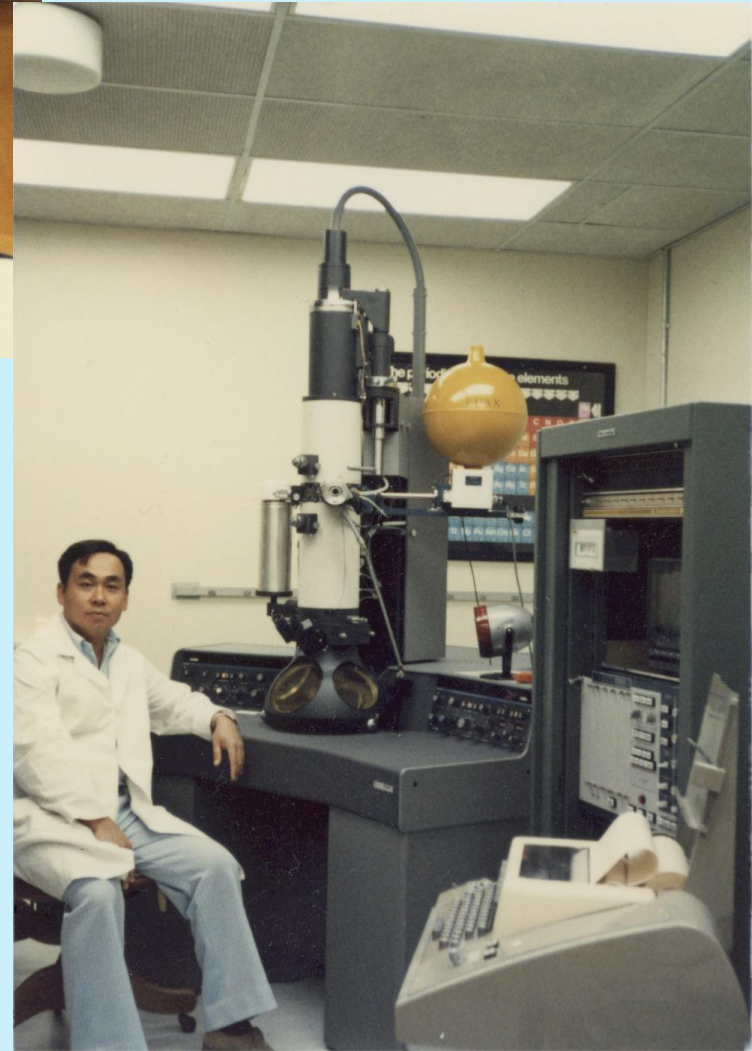
**Wrote mainly at work, 6-7 days a week. Slow and steady. Never rushed, never
rested. Champagne and a cigar.**



Tony Lalonde

Assistance from capable people who were infected with his passion for learning about the cell. Powerhouse of productivity.

Niki Yong



After the book was published, FNG started an annual tutorial at home in Saskatoon, where he taught 6-8 hours a day for 4 days, cassette after cassette of kodachrome slides, covering extensive material in electron microscopy.

People came to the small town (<200,000) for 4 intense days of learning, In the middle of the Canadian prairies.



Peter Marcus wrote: The electron microscopy division he created in Saskatoon became the “mecca of ultrastructural pathology,” where students from all over the world came to attend his annual... “Tutorial in Ultrastructural Pathology and Diagnostic Electron Microscopy of Tumours.”...

***“Ultrastructural Pathology of the Cell and Matrix* had become firmly established as a reference work— “the bible.”**

I remember hearing my father and mother laugh when she was typing. She could decipher that someone published a reference they had never actually read, because the error in the reference could be seen to be propagated through the literature. The idea that someone would use a reference they hadn't read was truly unimaginable to them. (Endnote, Zotero, etc.)

Peter Marcus said that the electron microscope suited FNG well, “during the frigid Saskatoon winter months, he would seek relief from the oppressive central heating in the medical school building, by escaping to the electron microscope room which, of necessity, needed to be kept at a relatively cool temperature” (P. Marcus, MD).

During this period of his life FNG travelled a fair amount with frequent invitations to speak at meetings

Article from Adelaide, Australia – conference on electron probe X-ray analysis. 90% about his other talents.

**It's no laughing matter:
he is a genius**

By Science Writer BARRY HAILSTONE

Professor Feroze Ghadially gives a belly laugh when it is suggested he is a genius..

But the facts are hard to dispute. He is a doctor, scientist, violinist and sculptor — with an international reputation for each talent.

The 58-year-old Bombay-born professor of pathology at the University of Saskatchewan, Canada, is in Adelaide to attend an Australian Academy of Science national conference on the electron microscope.

As an electron microscopist, he is one of the world's experts on the use of the electron probe for X-ray analysis in pathology — a new technology less than 10 years old.

As a violinist, he has not devoted much time to music professionally since he "retired" from the concert stage 15 years ago.

But he still plays Beethoven for enjoyment and recreation.

As a sculptor, he has works in several universities in Britain and North America.

He works in stone or wood — for enjoyment and recreation.

What does he enjoy most?

"I enjoy doing what I want to do when I have the urge to do it," he said yesterday.

Professor Ghadially attended the University of Bombay before studying at London University where he obtained the degrees of MD, PhD and DSc.

But it is in another field that



Professor Ghadially . . . a world authority on the use of the electron probe.

Professor Ghadially is probably best known around the world.

He has written a popular book on tropical-fish culture — another interest in which he excels.

Peter Marcus wrote, "Like the late great dermatopathologist, A. Bernard Ackerman, Feroze Ghadially was a master iconoclast and possessed a wonderful gift for explaining the complex and exposing scientific nonsense in the most entertaining way. Because of this attribute, he was (like Dr. Ackerman) a much sought-after speaker at professional meetings.

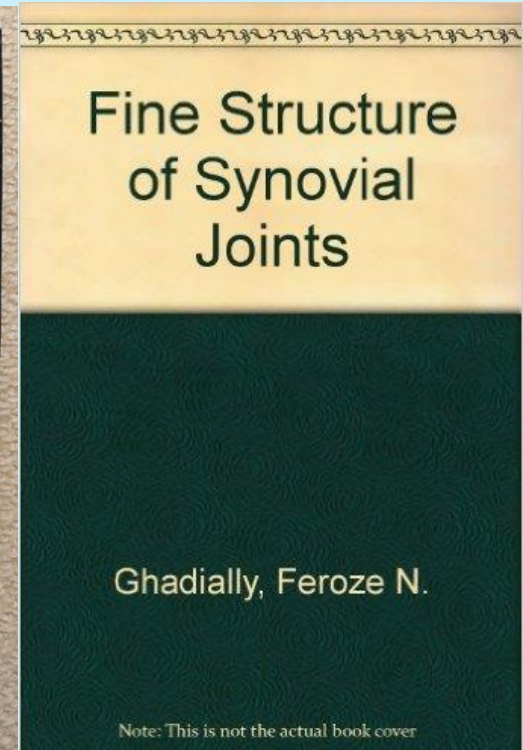
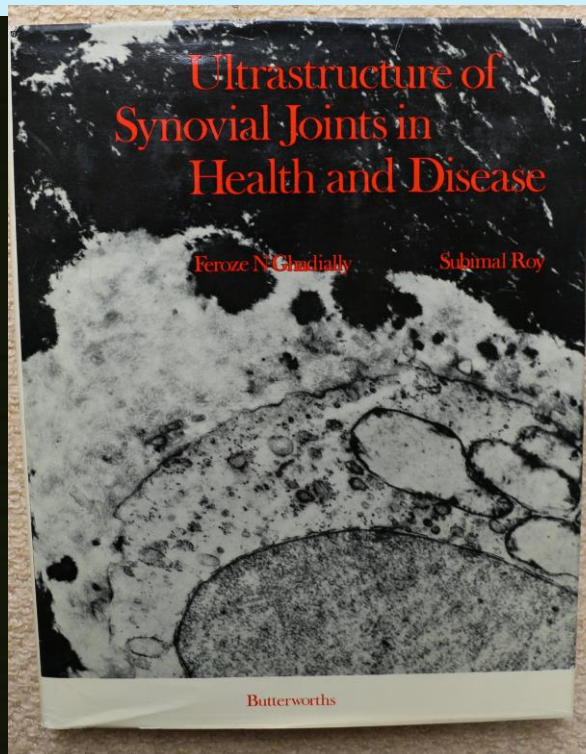
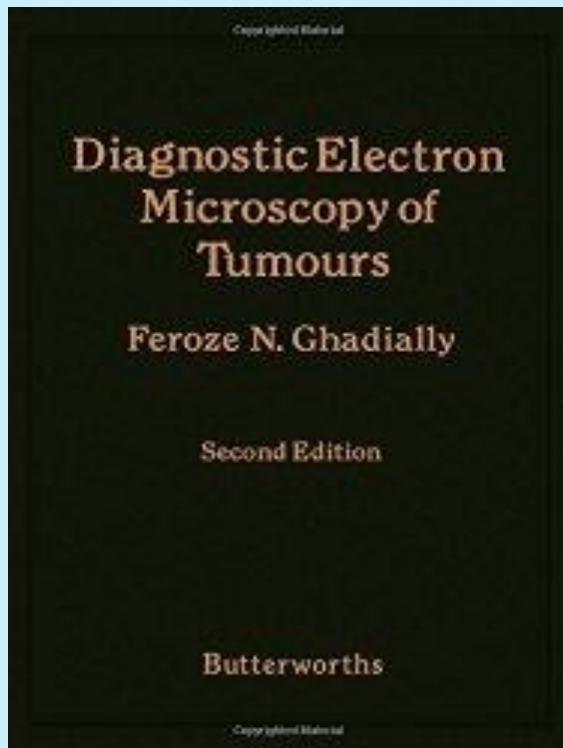


Four editions of *Ultrastructural Pathology of the Cell and Matrix* were published - the third became a two-volume work.

Only later did FNG realize how clinically-relevant diagnostic conundrums could often be solved using electron microscopy.

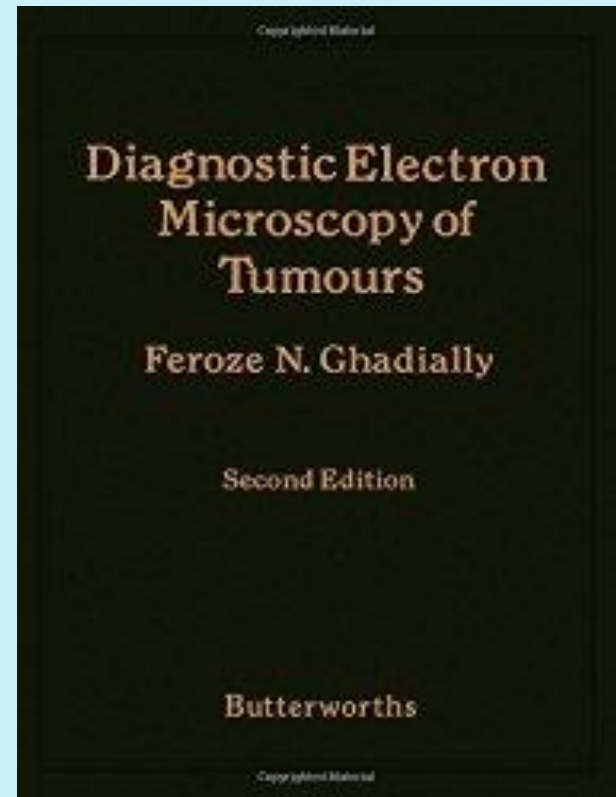
Work in electron microscopy began to take on more clinical relevance.

Loved getting case of difficult tumors from all over the world. Stamp collection.



His book, *Diagnostic Electron Microscopy of Tumours* sold out within 4 months of publication.

Listed as one of the top six medical books published in 1983 by the Medical Writers Group of the Society of Authors, London, England.



THE LATER YEARS (1989-2014)

In early 1989, after reaching mandatory retirement age, FNG moved to Ottawa, where he was appointed adjunct professor of pathology at the University of Ottawa.

He worked in the pathology department of the Ottawa Civic Hospital and the Canadian Reference Centre for Cancer Pathology on a part-time basis.

The difficult-to-diagnose cases referred there provided unique material for his ongoing work on diagnostic ultrastructural microscopy.

Idiosyncrasies

Peter also wrote that FNG was “Acutely aware of his own outstanding abilities and accomplishments and—refreshingly—was not shy about mentioning them. On the other hand, he was able to chuckle at his own idiosyncrasies and eccentricities. He had a disarming ability to laugh at himself...” Feroze Novroji Ghadially, 1920–2014: a personal remembrance

1. Polymath – hopeless at math

2. No sense of direction

Peter Marcus remembered FNG collecting him at Saskatoon’s King George Hotel and immediately after introducing himself, excitedly telephoning his wife to proudly announce that he had found Peter!

With his EM tutorial students, he lost his way to his favorite Greek restaurant and had to return home and start over.

Managed to board the wrong flight to New York, ending up there instead of home in Saskatoon.

3. Refused to accept scientific ideas for which he felt the evidence was not adequate.

One was cholesterol

Another was nicotine, which while it has bad effects, also has many beneficial effects: he regularly chewed nicotine gum

As for cholesterol, he always claimed the data was tenuous.

He would say “I can’t go to bed without some eggs on toast.”

“Cholesterol-free? Where is all the cholesterol they removed? It’s delicious. Where can I buy the cholesterol they removed?”

What made FNG FNG?

Passion for learning above all in life (= good student)

Personality - the ability to focus

Facilitating environment (= right partner)

Wrote in a readable way.

He explained the complex simply and exposed scientific nonsense in the most entertaining way.

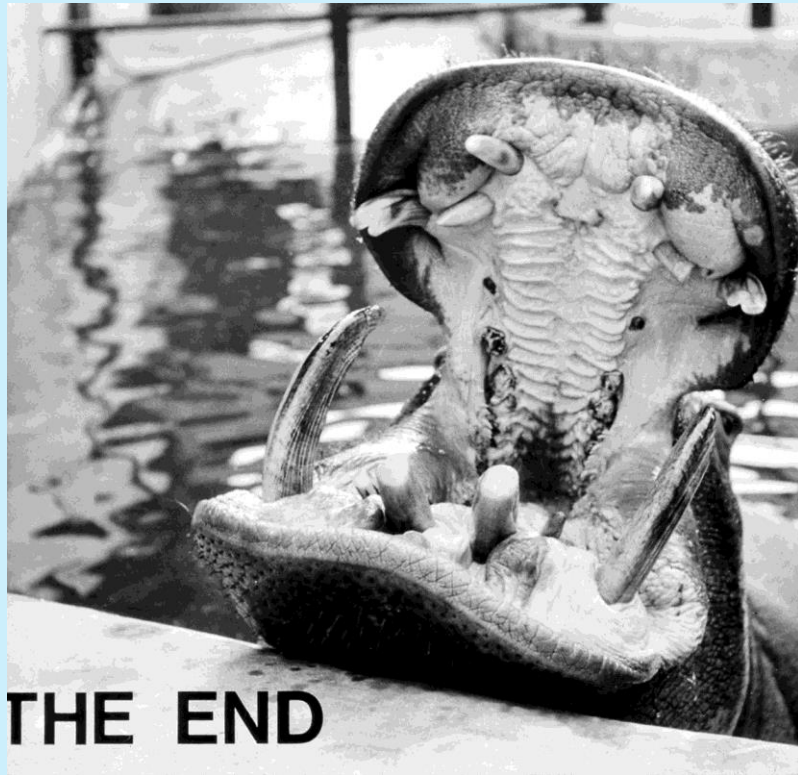
BUT

Nothing is more inspiring for a student than the dedicated, love of learning that FNG exemplified, whether you met him at work or in his home.

Great student = Great teacher

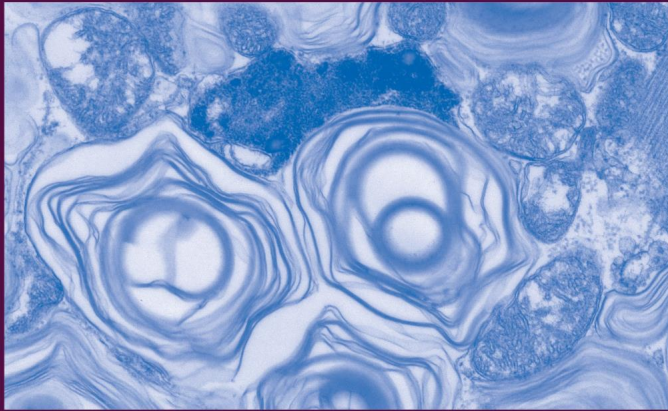
FNG had many great photographs that he and I used as THE END slides for our talks –The yawning hippo one was our absolute favorites.

Late 1930s, first arriving in London, with an early Leica camera



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Fifth Edition



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FNG

This book exemplifies his career. It was his passion.

The completeness of it, was a driver for him and sense of satisfaction.

He would be very grateful to Bart and John.

He told me the 4th edition would be the last. No one could do the amount of work needed.

He would be honored to know that many electron-microscopists contributed to bring it up to date to keep this valuable resource going.

Thank you:
Bart Wagner
John Stirling
All the chapter contributors

