The prelude to the Finnish nuclear technology effort

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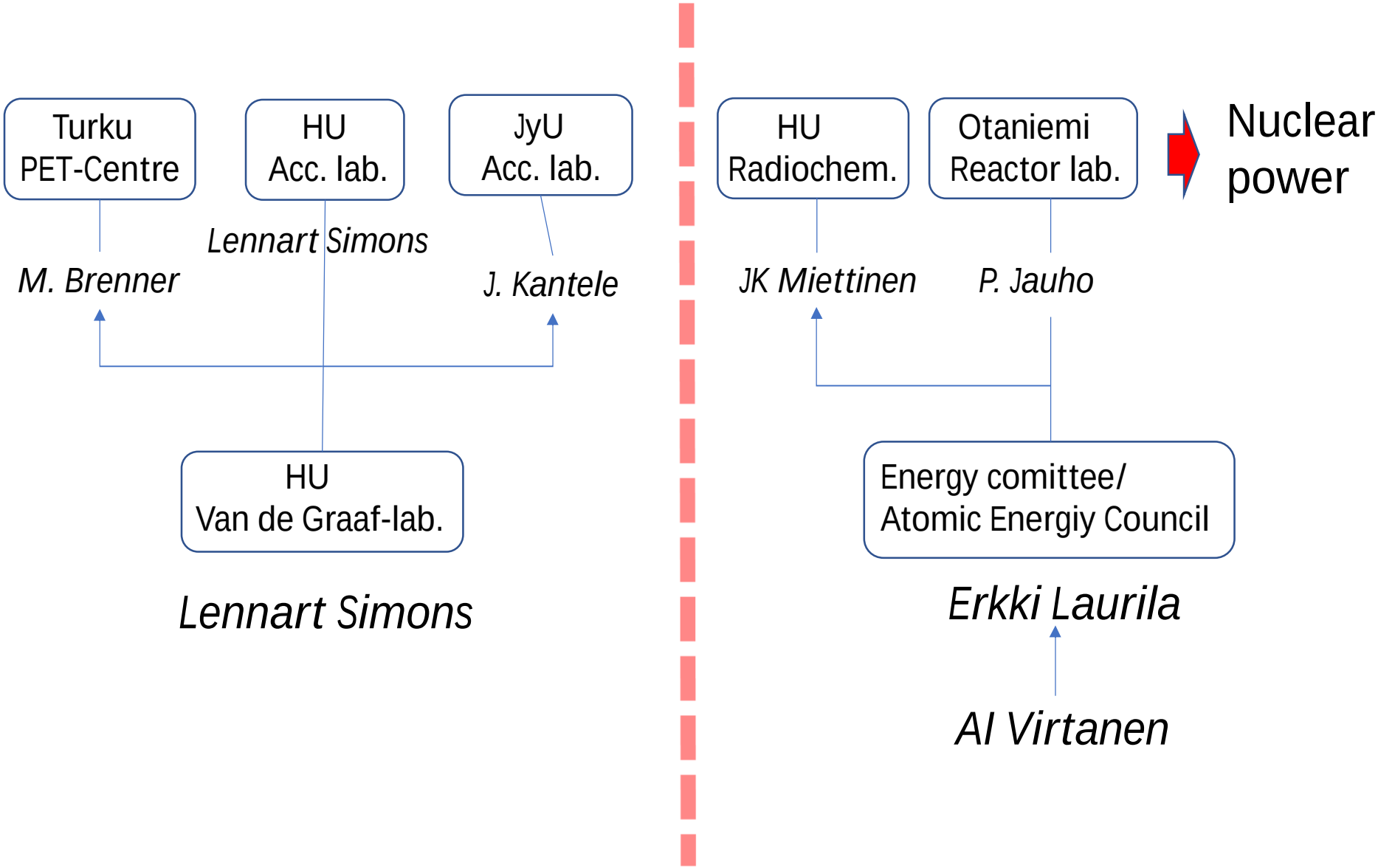
Finnish nuclear physics and –technology: major items



A.I. Virtanen (AIV) and the Institute of Biochemistry

- Ph.D chemistry 1919
- Valio laboratory 1921
- Developed AIV food preservatives
- Institute of Biochemistry 1931
- Nobel Prize 1945

Very influential
in the 40's and 50's

Lennart Simons: The beginning of the career

1932: Ph.D in physics

1938–1940: Guest researcher at the Niels Bohr instituute.
Got acquainted with nuclear physics.

1941: Professor at University of Helsinki

→ Beginning of nuclear physics in Finland

1938 – 1939: Uranium fission

7/1938

Lise Meitner:
Escape to Sweden
Otto Hahn: continues research on uranium

Meitner and Hahn in the Berlin laboratory c. 1910.

12/1938

Hahn makes first radiochemical observations of fission in uranium

Meitner and O.R. Frisch develop a simple model for the fission

1/1939

At the Bohr institute Frisch makes the first direct observations of fission.

Lennart Simons aids with the experiments, and begins himself to study fission.

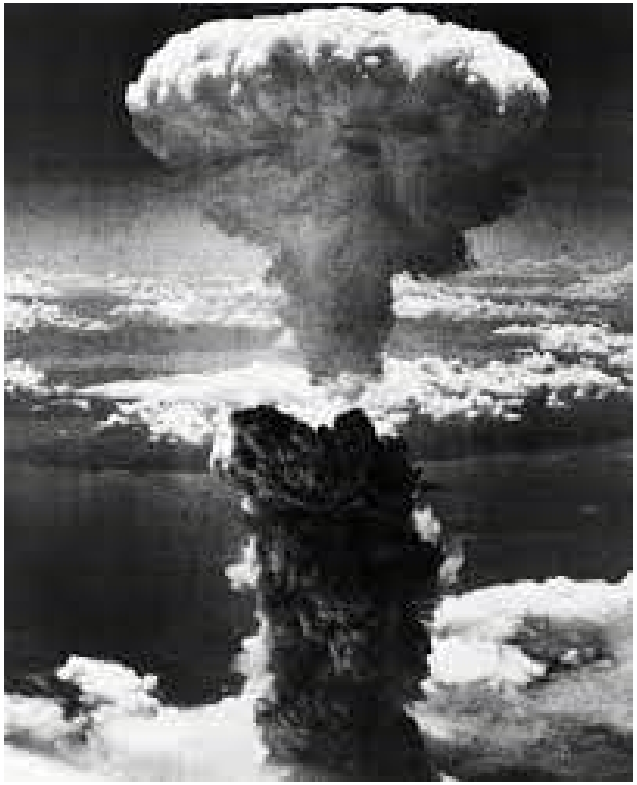
The Manhattan project: Atomic bomb based on Uranium fission

1942 - 1945

Manhattan project in the USA
(O.R. Frisch participates)

1945

The USA drops two atomic bombs on Japan
(Hiroshima, Nagasaki).
End of World War II



Lise Meitner after the war

- Very famous just after the war

- With President Harry Truman at her America-tour.

Meitner visited Finland in 1947, hosted by Lennart Simons.

Simons work in the 40's on asymmetry of uranium fission

In fission, the nucleus generally splits asymmetrically

Simons began in Copenhagen work on determination of the asymmetry and continued it after the war in Helsinki

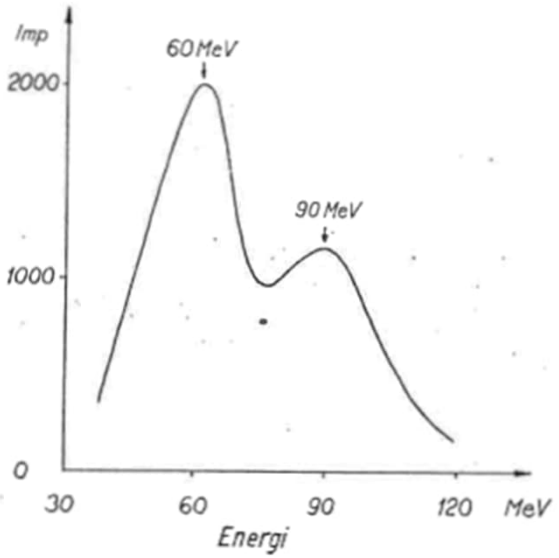


Fig. 1. Fissionsfragmentens energispektrum

Lennart Simons, Sjätte Nordiska Kemistmötet, Lund, 1947

The work was shortlived and got little attention, since in the USA more accurate measurements were made

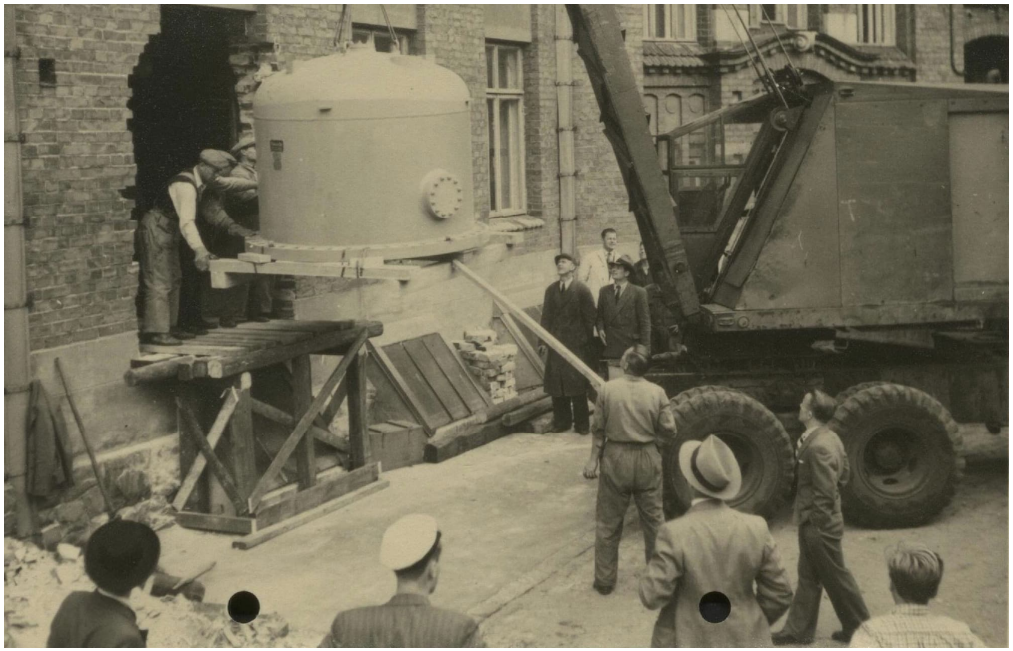
Simons and the beginning of nuclear physics: the Van de Graaff-accelerator

Internationally competitive research in nuclear physics required obtaining an accelerator

Funding for Van de Graaf in 1947

The economy was still in warlike condition, so the funding was very exceptional

Not operational until 1958



1946: *Runar Gåsström* began as assistant for Simons. Worked until 1951 within the Van de Graaff-project

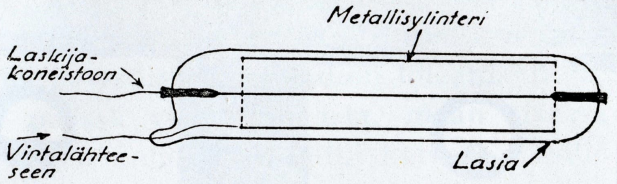
Simons and beginning of nuclear technology: Medical isotope-based diagnostics

1946

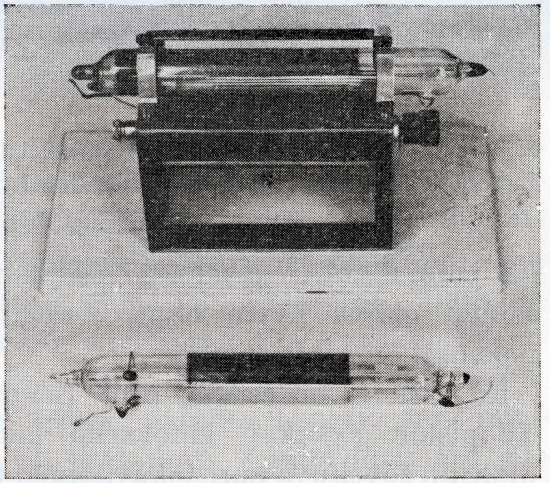
Simons took the initiative whereby research began on the use of isotopes in medical diagnostics at the Maria Hospital

1948-1954

Runar Gåsström was in charge of the practical realization of the collaboration with medical scientists



Kuva 41. Geiger—Müller-putki. Kaavakuva.



Kuva 42. Geiger—Müller-putkia, joilla ydinhiukkasia voidaan todeta. Putkien pituus 10 cm. Valmistetut Helsingin Yliopiston Fysiikan laitoksessa. L. Simonsin valok.

Who was Runar Gåsström ?

Viktor Gåsström, previous America-immigrant and red agitator, supported his family (incl. Runar Gåsström) as independent housebuilder. The son Runar Gåsström studied physics at Moscow University.

1906 USA

1933 Soviet Union

1946 Finland

Runar Gåsström
at prof. Simons

A.I. Virtanen and Lennart Simons

AIV became chairman of the Academy of Finland in 1948

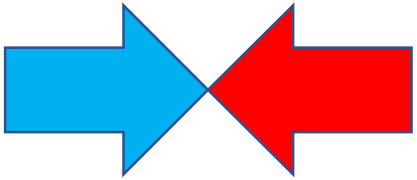
Uncompromising opponent of ”YYA-politics”

Hostile to the few left-leaning or progressive minded scientists

Simons became at the end of the war outspokenly progressive on political matters

Was modestly active in the Swedish Peoples Party, where he represented the left wing

Politically more passive since the 50’s



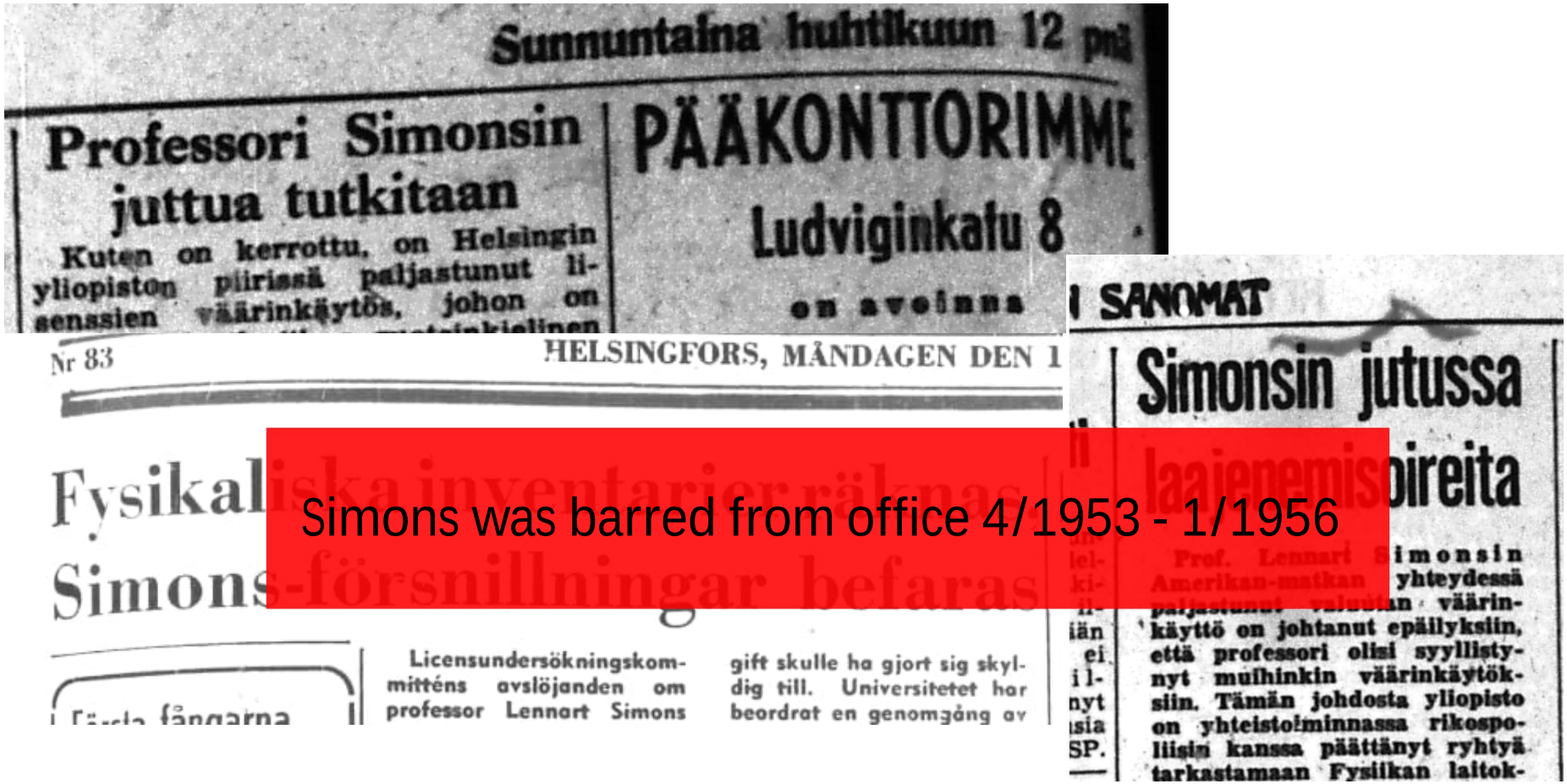
Several indirect índications of a collision. Was probably unavoidable.

The Simons case in the Helsinki Court of Appeals (Helsingin hovioikeus)

1953

Simons was suspected of embezzlement and smaller wrongdoings

The charges were officially initiated by Department head prof. Nils Fontell



Sunnuntaina huhtikuun 12 pnä

Professori Simonsin juttua tutkitaan

Kuten on kerrottu, on Helsingin yliopiston piirissä paljastunut lisenssien väärinkäytös, johon on

PÄÄKONTTORIMME

Ludviginkatu 8

on avoinna

Nr 83 HELSINGFORS, MÅNDAGEN DEN 1

Fysikaliska inventarier räknas

Simons-försnillningar befaras

Licensundersökningskommitténs avslöjanden om professor Lennart Simons

gift skulle ha gjort sig skyldig till. Universitetet har beordrat en genomgång av

SANOMAT

Simonsin jutussa

laajenemispiireitä

Prof. Lennart Simonsin Amerikan-matkan yhteydessä paljastunut valuutan väärinkäyttö on johtanut epäilyksiin, että professori olisi syyllistynyt muihinkin väärinkäytöksiin. Tämän johdosta yliopisto on yhteistoiminnassa rikospoliisin kanssa päättänyt ryhtyä tarkastamaan Fysiikan laitok-

Simons was barred from office 4/1953 - 1/1956

Runar Gåsström moves abroad

Runar Gåsström statements on Simons under police investigation

→ Gåsström suddenly in the focal point of the Simons case in the summer 1954

Ylioppilaslehti
22.10 1954

4 N:o 34 — YLIOPPILASLEHTI — 1954

MITÄ TAPAHTUU FYSIIKANLAITOKSELLA?

ASSISTENTTI HERÄTTÄÄ HUOMIOTA

Helsingin yliopiston fysiikan laitos on viime aikoina herättänyt kaupungilla paljonkin puheenaihetta. Keskustelut ovat saaneet alkunsa erään assistentin, maist. Gåsströmin edesottamuksista. Valitettavaa vain on, että tämän tavallisesti omaan laskuunsa toimineen henkilön puuhat ovat aiheuttaneet tahran koko laitoksen ylle.

lä hän hallitsee ydinfysiikan kysymysten tutkimisessa tarvittavien kojeiden lisäksi myös ruotsin, suomen, venäjän, englannin, ranskan ja saksan kielet.

TIEDEMIEHEN UTELIAISUUTTAKO?

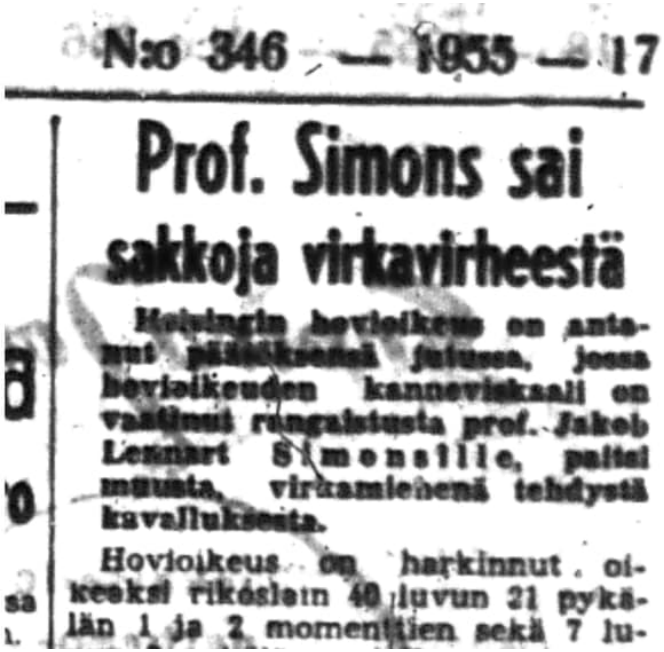
Assistentti Gåsström on osoittautunut tutkijaksi, joka on kaikessa pyrkinyt pysymään ajan tasalla. Mutta hänen tiedonjahin, mm Englantiin. Maist. Gåsströmin vierailut ovat usein muodostuneet todellisiksi pakkovierailuiksi. Niinpä Tukholman Nobel-instituutista lähetettiin tänne terveiset, että maist. G. nuuskintoineen on käynyt todelliseksi maanvaivaksi ja että olisi syytä pitää hänet täällä aisoissa. Ranskassa maist. G. opiskeli sikäläisen valtionstipendin turvin, jonka "salonkikommunisti" Joliot-Curien satiin molemmat Buckit, varsinkin, kun Gåsströmin auto oli Ranskassa rekisteröity, kuten kaikitenkin hänen uusi Austininsakin. Maist. Gåsström on usein kertonut saaneensa stipendejä? Mistä? Yhtämittaiset stipendit ja ulkomaanmatkat edellyttävät, että jossakin on stipendirahasto, jonka avokätisyys varmaan vetää vertoja Suomen Kulttuurirahastolle ja Vihurin säätiöllekin. Sillä esim. Suomen Fyysikko-

→ Runar Gåsström with family moves to Holland 10/1954, never to return

The Simons case in the Helsinki Court of Appeals (Helsingin hovioikeus)

1955

Verdict 22.12: Simons was given minor fines, but in practice he won the case



N:o 346 — 1955 — 17

Prof. Simons sai sakkoja virkavirheestä

Helsingin hovioikeus on antanut päätöksensä juttuun, jossa hovioikeuden kanneviskaali on vaatinut rangaistusta prof. Jakob Lennart Simonsille, paitsi muusta, virkamiehenä tehdystä kavalluksesta.

Hovioikeus on harkinnut oikeaksi rikoslain 40 luvun 21 pykälän 1 ja 2 momenttien sekä 7 lu-

The case was quickly forgotten by the general public

1955 - 1958: The Energy committee

12/1953 — President Eisenhower holds in the UN his *Atoms for Peace*-talk

End of 1954 — Serious discussions in the Akademy of Finland

16.3 1955 — Letter from Akademy/AIV to the Government

25.3 1955 — The Government assigns the Energy Comittee, with prof. Erkki Laurila as chairman

Erkki Laurila and TKK (now Aalto Univ.) technical physics

1945 Professor of technical physics at TKK

Activities:
- Computer technology
- Control engineering
- Semiconductor technology

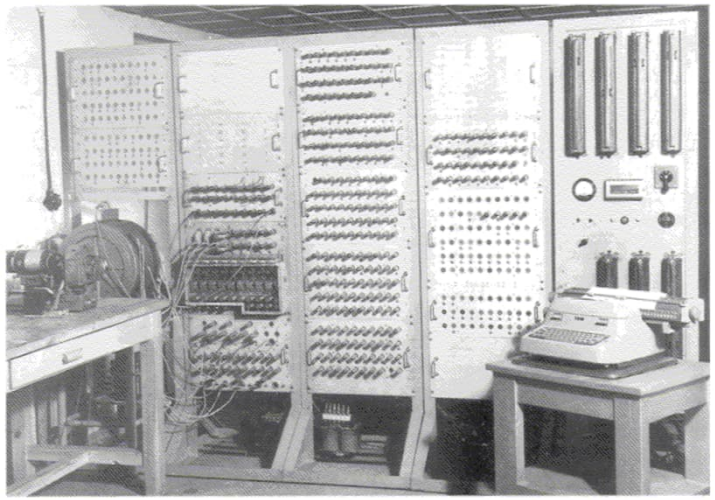
Laurila was a pioneer of these fields in Finland

1954 Laurila was the key person in founding the ”Matematiikkakone-komitea”, a committee working towards constructing the first computer in Finland

1955 ➡ CHAIRMAN OF THE ENERGY COMMITTEE

Erkki Laurila as pioneer of the computer age: Two examples

The ESKO-computer
(Matematiikkakone-komitea)



Semiconductor technology

Erkki Laurila,
Lämpösähköisten ilmiöitten teknillisistä sovellutuksista
Arkhimedes, No.1, 1957

Erkki Laurila,
Puolijohteiden fysiikasta
Arkhimedes, No.1, 1958

- Laurila was for his time excellently versed in the scientific-technological basis of the rising field of computing
- Laurila's change of direction was no small matter

The Energy comittee and the Atomic Energy Council [Atomienergianeuvottelukunta (AEN)]

Energy committee 1955 – 1958

Committee Report 1956:

- Test reactor to TKK
- Other investments in atomic technology

AEN at the Ministry of Finance in 1958

Atomic Energy Council (AEN) 1958 →

Erkki Laurila chairman → 1977

The Energy committee and Lennart Simons

During 1954 – 1958 Simons was active both on research on reactor technology as well as in the public debate on atomic technology.

9.9 1958

HELSINGIN SANOMAT

Prof. Simons esitelmöi Geneven atomikokouksessa

Muillakin pohjoismailla puheenvuoro

(Erikoisesti Helsingin Sanomille)

★] Geneve, 8. 9. (UPI)

Geneven rauhanomaisessa atomikonferenssissa kohdistui huomio maanantain istunnoissa Pohjoismaihin, joiden edustajat esittelivät tutkimuksiaan aina

Maallikon on vaikea saada käsitystä esitelmän sisällöstä, mutta täkäläiset tiedemiehet sanoivat, että prof. Simonsin tutkimustyö lisää tietoja tältä alalta ja saattaa osoittautua hyödylliseksi uusien reaktorien suunnittelussa.

Still, Simons apparently was in no dealings with the energy committee

Did the Energy committee and the Simons case have a connection ?

Hypothesis: The underlying motive behind the Simons case was to keep Simons away from the Government allocations to atomic technology

Motivations:

The Simons case was unique and by itself quite senseless. It is questionable whether there was genuine faith in the charges

Simons leftist/progressive profile + suspect assistant Gåsström

Timing: just right for the hypothesis

Simons was in the early 50's the only internationally recognized nuclear physicist.
=> Without the Simons case difficult to justify sidelining him

There are hints that removing him from office was the goal of the charges

International paragons to the Simons case ?

France:
Frederic Joliot-Curie

Leading nuclear physicist in France

Member of the French Communist party

Directed French Research on atomic technology (CEA) until was dismissed in 1950 for political reasons.

USA:
Robert Oppenheimer

Physicist who was scientific leader of the Manhattan-project.

Like many other phycisists, had in the 30's some connections to the communist movement

Had to face hard and public investigations in the 50's because of suspected ties to the Soviet Union.

A "case" connected to Simons:

Professor of nuclear Physics, Phil B. Smith, Groningen Univ.

- "McCarthy-refugee" from USA
- active in Pugwash-movement.

- Participated in Dutch-Nordic Accelerator-symposium in Hanko in 1964.
- Simons guest lecturer at HU Dept. of Physics 1-5/2 1965.

Via Test Reactor to Nuclear power

The Otaniemi Test Reactor became operational in 1962

Formed the basis of TKK teaching and research of atomic technology

The Loviisa nuclear reactor was ordered from the Soviet Union in 1969

The Loviisa & Olkiluoto nuclear power stations were operational by the early 80's

Runar Gåsström ”Back in the USSR”

1960 — Return to Soviet Union

1960 – 1990 — Doctor of Science 1961 in non-public defence occasion

Was a well salaried professor

One picture tells more than …

1960’s: Gåsström (left), unknown, and Yuri B. Rumer (Georg Rumer), who is counted among the pioneers of quantum physics

SUMMARY

- The atomic history of Finland begins with Simons Copenhagen years 1938-1940
- The political strains of the time affected the development of atomic technology :
  - The Simons case
  - The career change of Laurila ?
- The significance of the Gåsström case is still unclear.

Markus Ahlskog

Katsaus Suomen varhaiseen atomihistoriaan

Finska Vetenskaps-societeten – Suomen Tiedeseura 2022

1847–1947

Maanantaina, toukokuun 5. pnä — N:o 119

Amerikka johtaa atomitutkimusta.

Euroop

MARKUS AHLSKOG

KATSAUS SUOMEN VARHAISEEN ATOMI-HISTORIAAN

Suomen Tiedeseura 2022