

JONAS SALK & THE STORY OF POLIO





# KEY TERMS

EXTERNAL FORCES:

JONAS SALK & THE STORY OF POLIO

MENTORSHIP

COMPETITION



# KEY TERMS

## INTERNAL FORCES:

CRAFT

EXTRAPOLATION

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THE FIRST POLIO EPIDEMIC OF 123  
CASES OCCURRED IN THE SMALL  
TOWN OF RUTLAND, VT IN 1894.

IN 1905 THERE WERE OVER 1200  
CASES IN SWEDEN, MOSTLY IN  
ISOLATED AREAS.





IN 1916 THERE WAS AN EPIDEMIC  
IN NEW YORK IN AN ITALIAN  
NEIGHBORHOOD CALLED PIGTOWN IN  
WHICH THERE WERE 8900 CASES,  
RESULTING IN 2400 DEATHS.

IN 1916 ALONE, 6000 AMERICANS  
DIED OF POLIO.





## STRANGE THINGS ABOUT POLIO:

1. STRUCK MOSTLY DURING THE SUMMER.
2. HIGHLY COMMUNICABLE- DEVASTATING ENTIRE COMMUNITIES.
3. SEEMINGLY NOT TIED TO HYGIENE- RICH AND WELL CARED FOR PEOPLE CAUGHT IT TOO.
4. STRUCK CHILDREN THE HARDEST.
5. THOSE WHO SURVIVED WERE OFTEN PARALYZED.

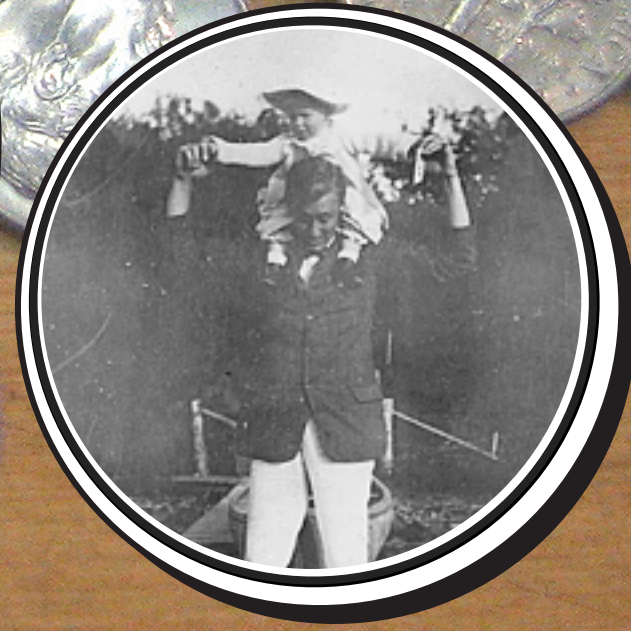
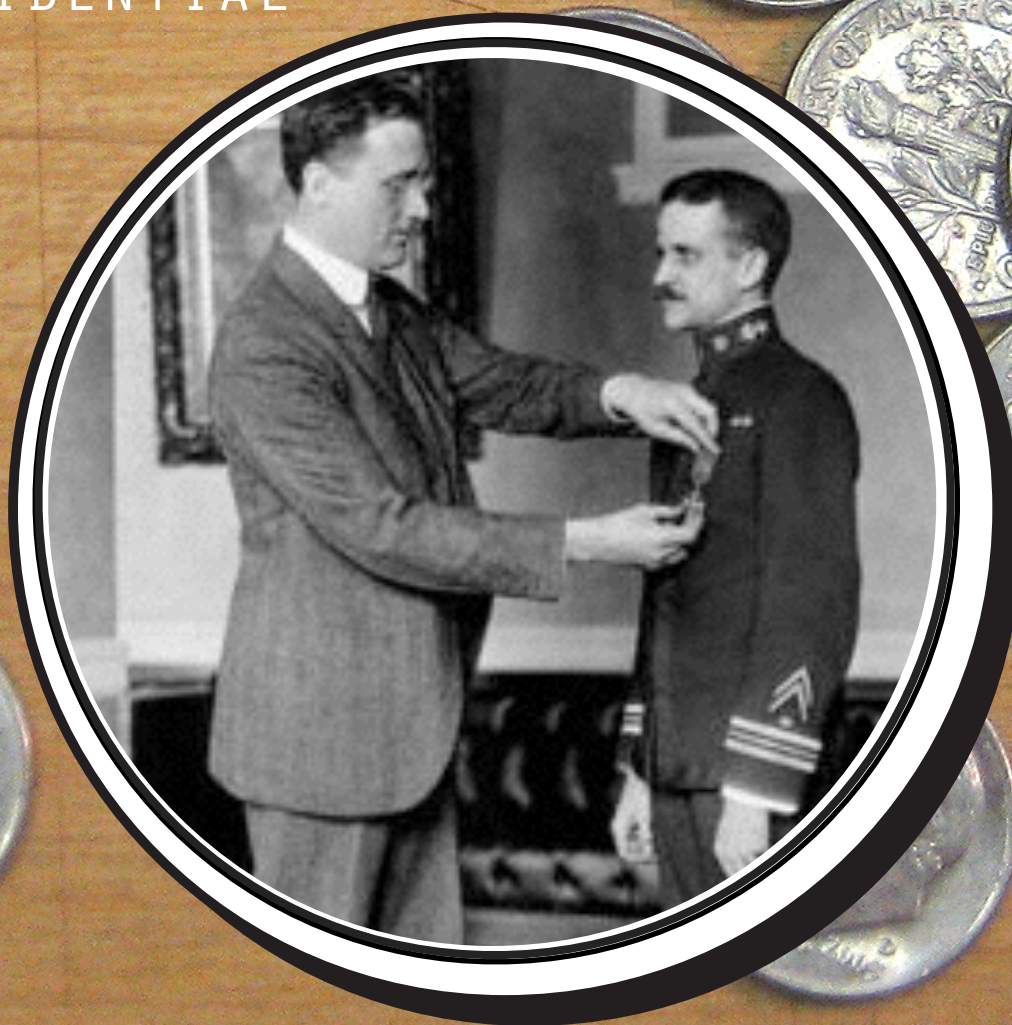




# THE MOST FAMOUS CASE: FRANKLIN ROOSEVELT

IN 1921 AT THE AGE OF 21,  
ROOSEVELT HAD BEEN:

- SECRETARY OF THE NAVY
- CONGRESSMAN FOR NEW YORK
- UNSUCCESSFUL VICE-PRESIDENTIAL  
CANDIDATE IN 1920



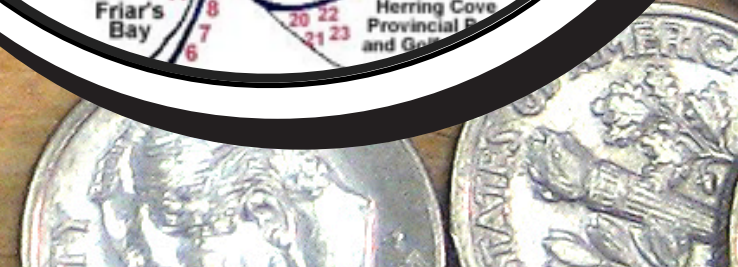
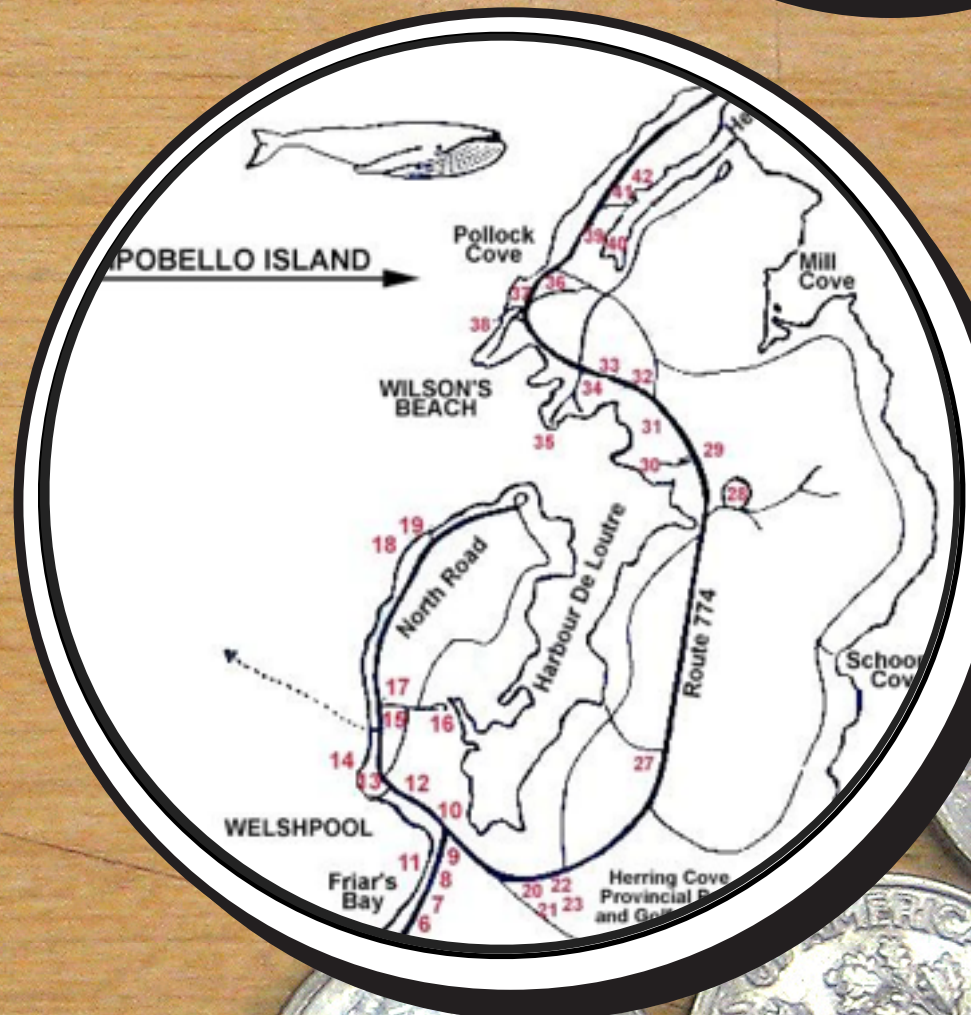




**AUGUST 1921**

ROOSEVELT HAD WORKED VERY HARD THROUGH A STIFLINGLY HOT SUMMER IN WASHINGTON AND WAS RUN DOWN.

ON HIS WAY TO HIS SUMMER HOME AT CAMPOBELLO ISLAND IN MAINE, HE STOPPED AT A BOY SCOUT JAMBOREEE NEAR HIS HOME IN HYDE PARK.





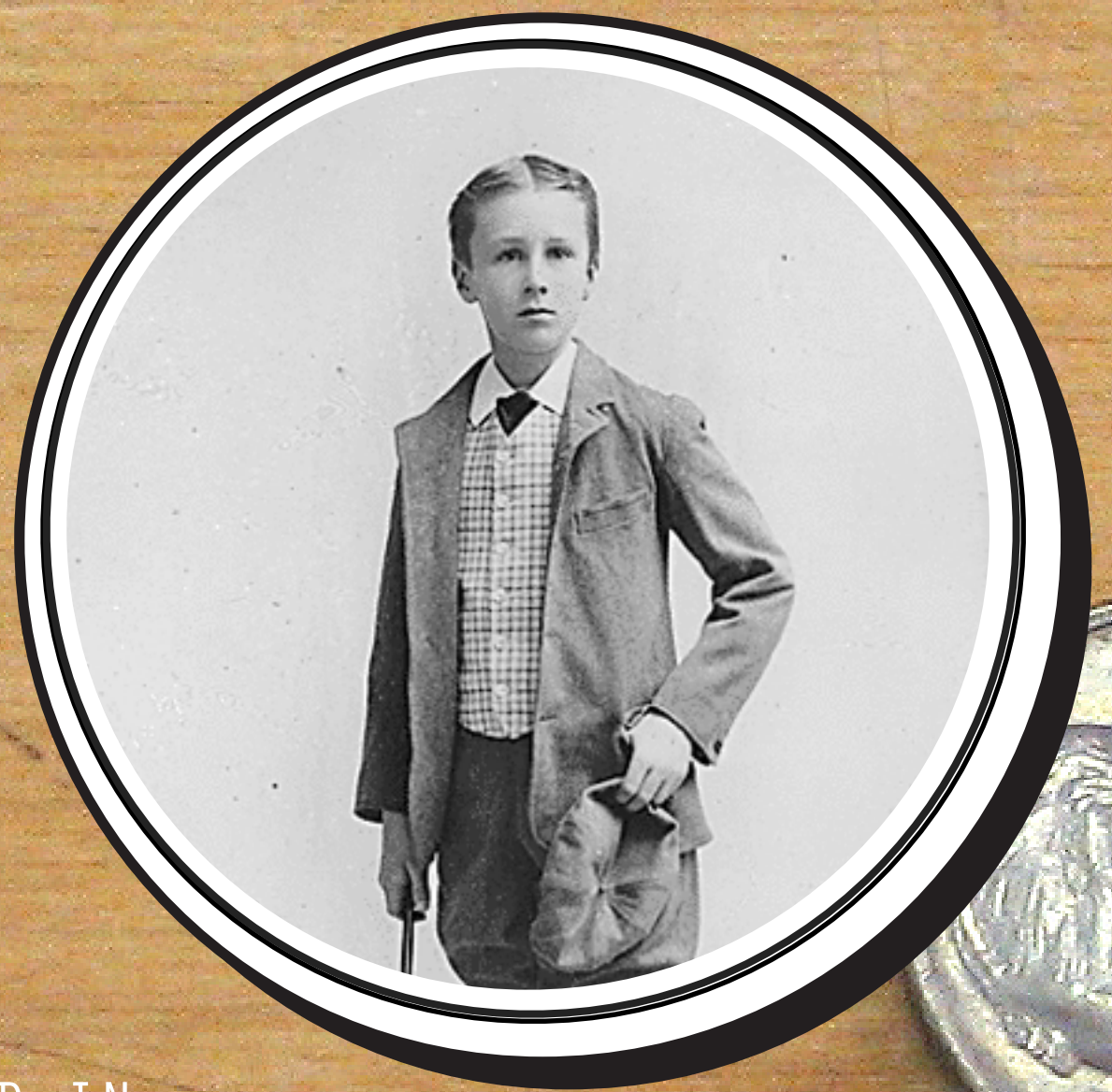


**ARRIVED AT CAMPOBELLO  
ON AUGUST 7, 1921**

THE NEXT DAY ROOSEVELT WENT :  
- SAILING WITH FAMILY  
- HELPED PUT OUT A BRUSH FIRE  
- HAD A RUN/SWIM RACE WITH HIS KIDS  
IN THE FREEZING COLD BAY OF FUNDY  
- SPENT THE AFTERNOON READING THE  
NEWSPAPER IN HIS WET BATHING SUIT



## **ROOSEVELT WAS A CLASSIC TARGET FOR POLIO**



1. SHELTERED AS A YOUTH- TUTORED IN RELATIVE ISOLATION
2. LOW RESISTANCE TO INFECTION- MEDICAL HISTORY OF MANY CONTAGIOUS DISEASES
3. BODY WEAKENED BY STRESS & EXHAUSTION
4. ATTENDED GATHERING OF KIDS WHERE POLIO WAS LIKELY TO OCCUR
5. MANIC SPURT OF ACTIVITY INCLUDING A COLD SWIM



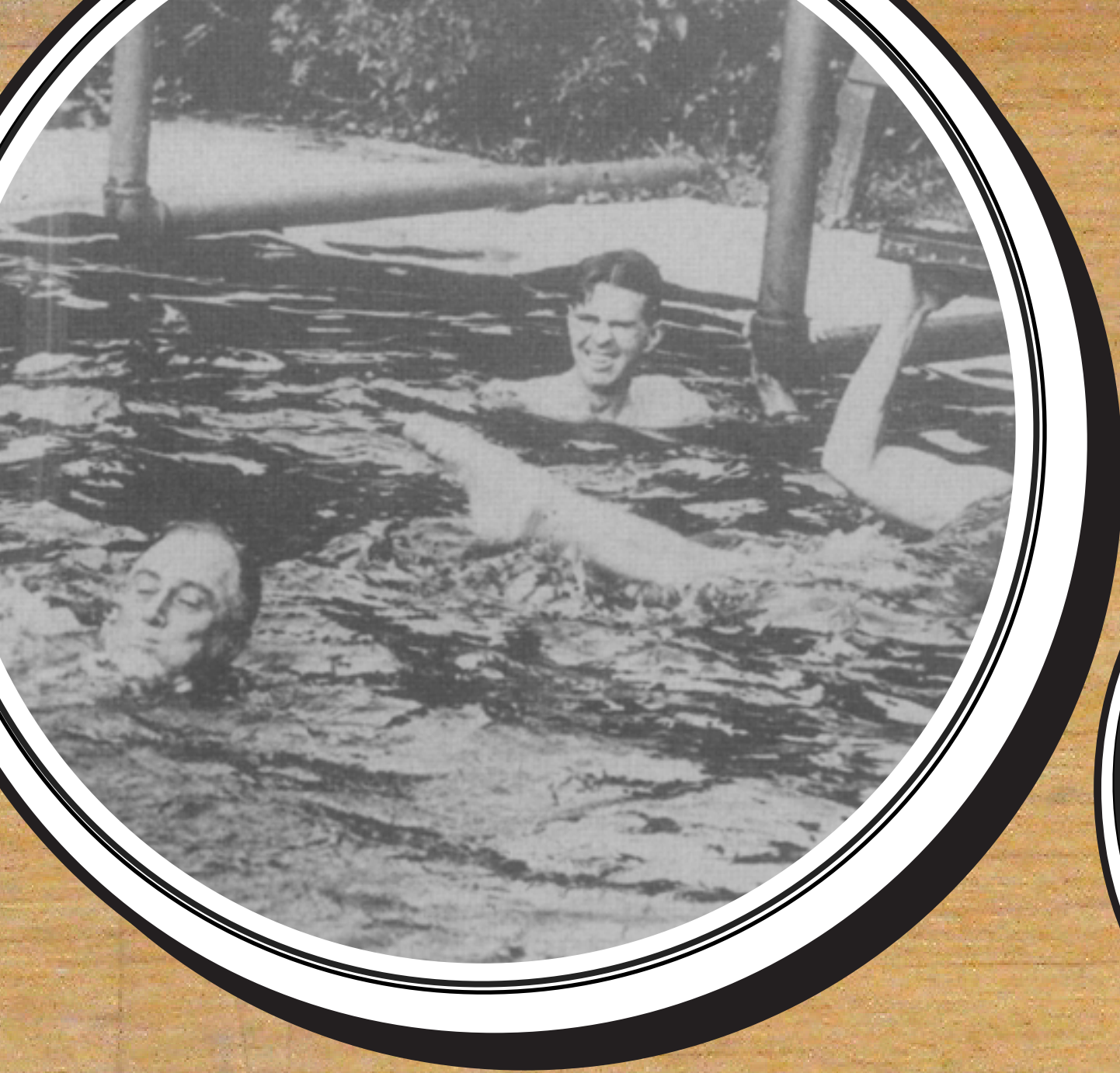


# *ROOSEVELT WAS INFATUATED WITH WARM SPRINGS, GEORGIA*

- TALES OF CURATIVE POWERS
- BEGAN SPENDING TIME THERE IN 1924
- BOUGHT WARM SPRINGS IN 1926
- CREATED NON-PROFIT FOUNDATION TO RUN IT







BETWEEN 1925 AND 1928 ROOSEVELT SPENT  
HALF OF HIS TIME AT WARM SPRINGS





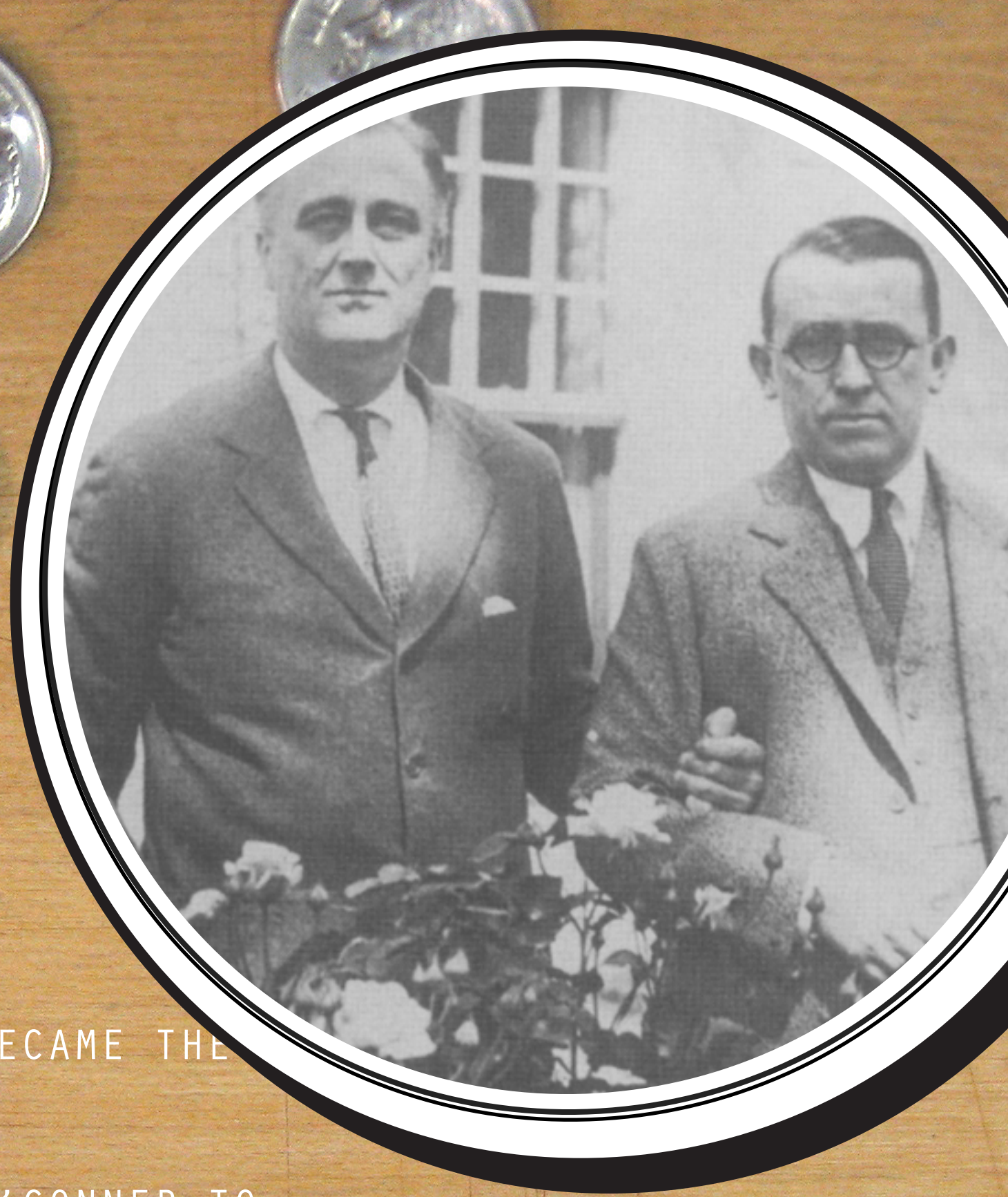


IN 1928 AL SMITH WHO HAD BEEN GOVERNOR OF NEW YORK WAS RUNNING FOR PRESIDENT AND WANTED ROOSEVELT TO RUN FOR HIS OLD JOB.

ROOSEVELT HAD KEPT HIS ILLNESS SECRET FROM THE PUBLIC AND HAD PLANNED SEVERAL MORE YEARS FOR RECOVERY BEFORE RETURNING TO PUBLIC LIFE IN 1932.







ROOSEVELT DECIDED TO RUN AND BECAME THE  
GOVERNOR OF NEW YORK IN 1928.

ASKED HIS LAW PARTNER, BASIL O'CONNER TO  
TAKE OVER THE JOB OF MANAGING WARM  
SPRINGS.





**AT 40 YEARS OLD, O'CONNOR'S STORY WAS OF RAGS TO RICHES**

- CATHOLIC WORKING-CLASS BACKGROUND
- CHAMPION DEBATER AT DARTMOUTH
- HARVARD LAW SCHOOL
- A CLASSIC WORKAHOLIC

AT HARVARD HE STUDIED SO HARD THAT HE EXPERIENCED TEMPORARY BLINDNESS BUT WITH THE HELP OF HIS CLASSMATES, WHO READ HIM HIS ASSIGNMENTS, HE GRADUATED NEAR THE TOP OF HIS CLASS.





**IN 1929 THE DEPRESSION HIT**



WARM SPRINGS DONATIONS WENT FROM \$369,000 IN 1929 TO \$30,000 IN 1932

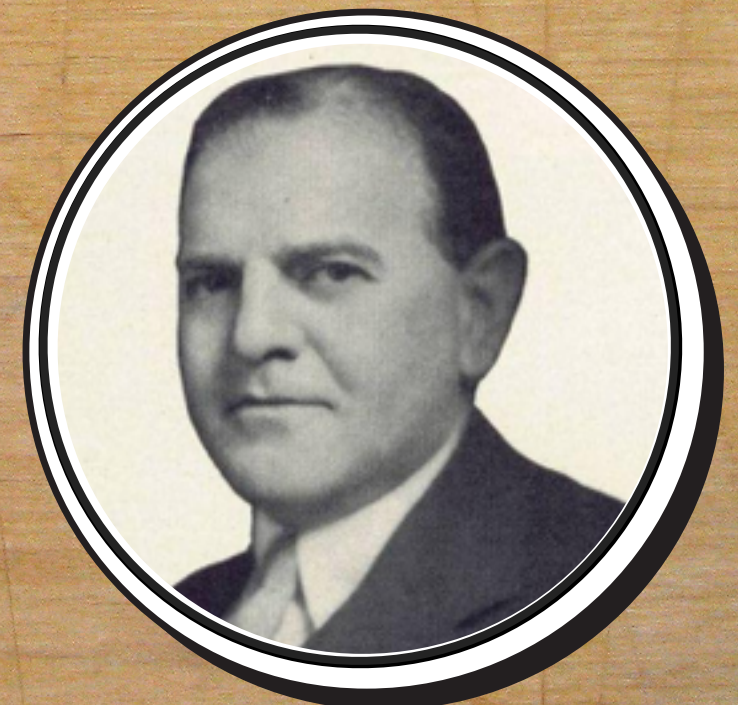




**ROOSEVELT BECAME A POTENT SYMBOL FOR POLIO VICTIMS AND THEIR FAMILIES**

O'CONNOR HIRED KEITH MORGAN WHO IN TURN HIRED CARL BYOIR TO DO FUNDRAISING.

CARL WAS A RISING STAR IN THE NEW FIELD OF PUBLIC RELATIONS.





IN 1932 ROOSEVELT IS ELECTED PRESIDENT

JANUARY 29, 1934 -

BYOIR PLANNED A NATIONWIDE BIRTHDAY PARTY FOR IMMENSELY POPULAR FDR TO RAISE MONEY FOR WARM SPRINGS







**'WE DANCE SO THAT OTHERS MAY WALK'**

EVERY CITY IN THE U.S. TO GIVE A BIRTHDAY BALL FOR THE PRESIDENT





O'CONNOR HOPED TO RAISE \$100,000 BUT PARTIES PRODUCED OVER \$1,000,000.

5000 PEOPLE GATHERED AT THE WALDORF ASTORIA TO HEAR GEORGE COHAN PERFORM.

MORE THAN 6000 PARTIES WERE GIVEN.



**THE NEW SECRET TO PHILANTHROPY  
IN THE GREAT DEPRESSION IS MANY  
SMALL DONATIONS**







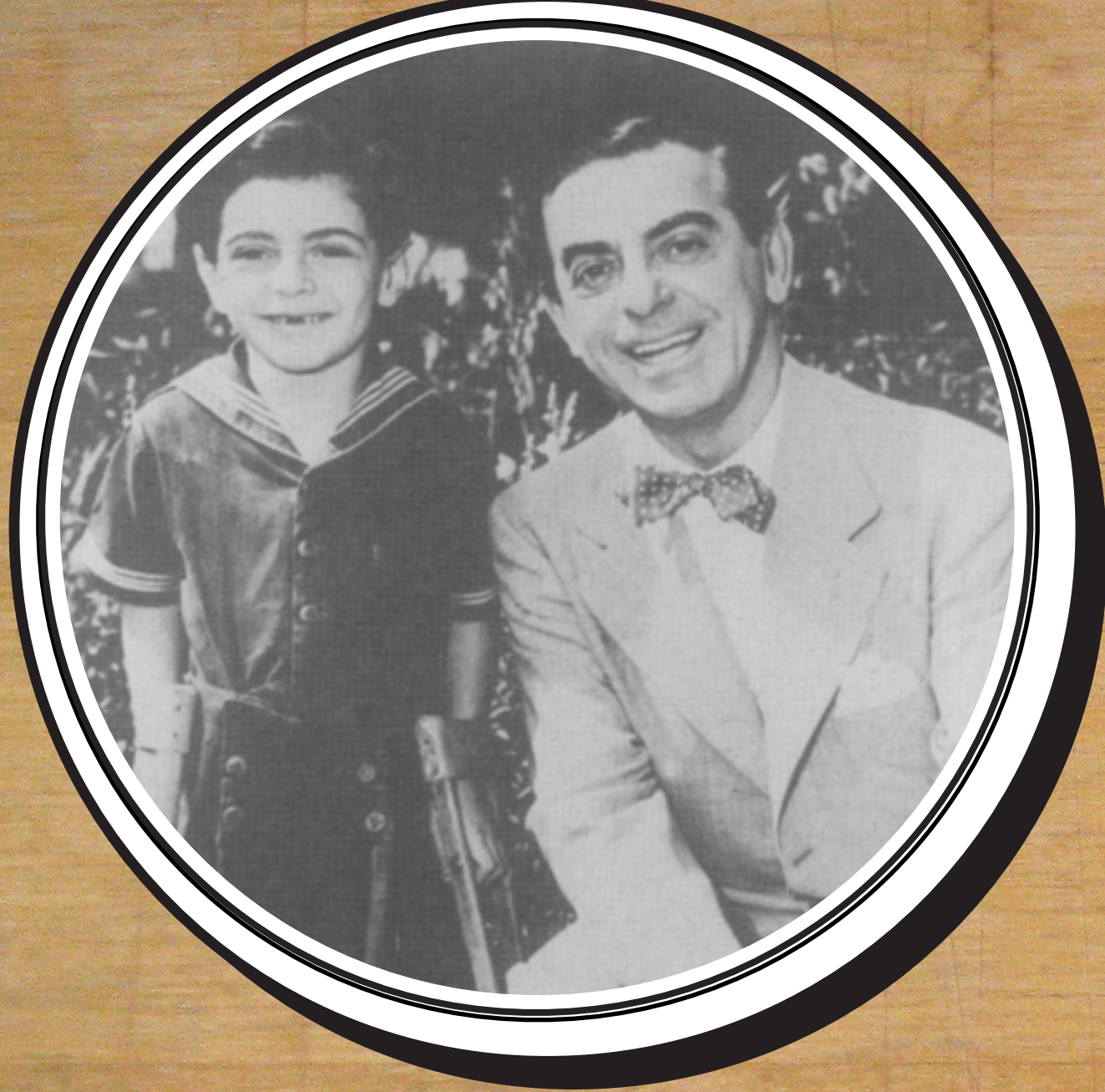
# NATIONAL FOUNDATION FOR INFANTILE PARALYSIS

BASIL O'CONNOR MADE IT  
THE MOST SUCCESSFUL  
PRIVATE CHARITY OF THE  
ERA, MORE VOLUNTEERS  
THAN ANY OTHER HEALTH  
ORGANIZATION EVER.





# MARCH OF DIMES



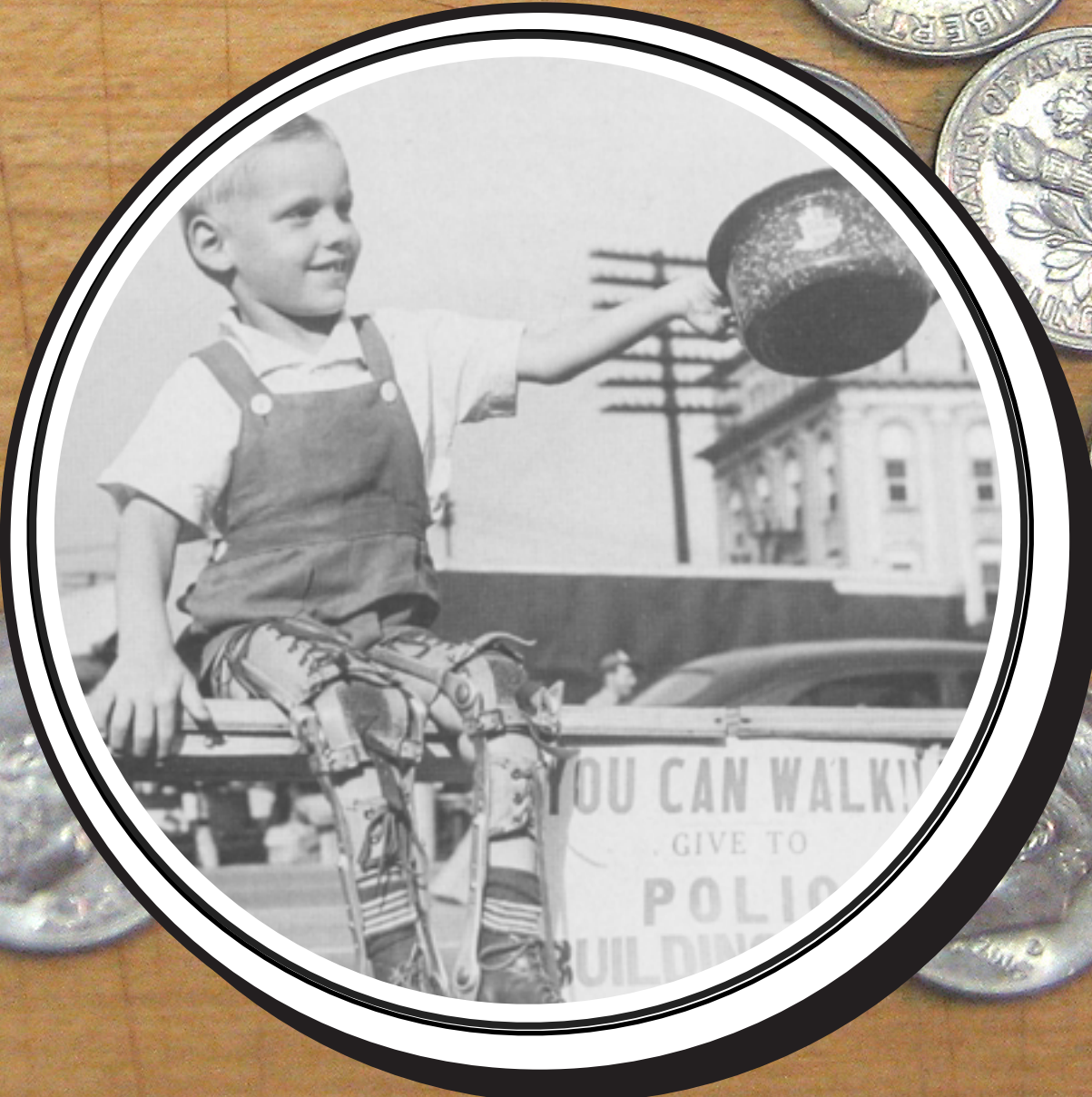
THE NAME CAME FROM NEWSREELS CALLED  
'MARCH OF TIME' - NAME GIVEN BY EDDIE  
CANTOR.

ASKED PEOPLE TO SEND DIMES TO THE  
PRESIDENT TO HELP CURE POLIO.





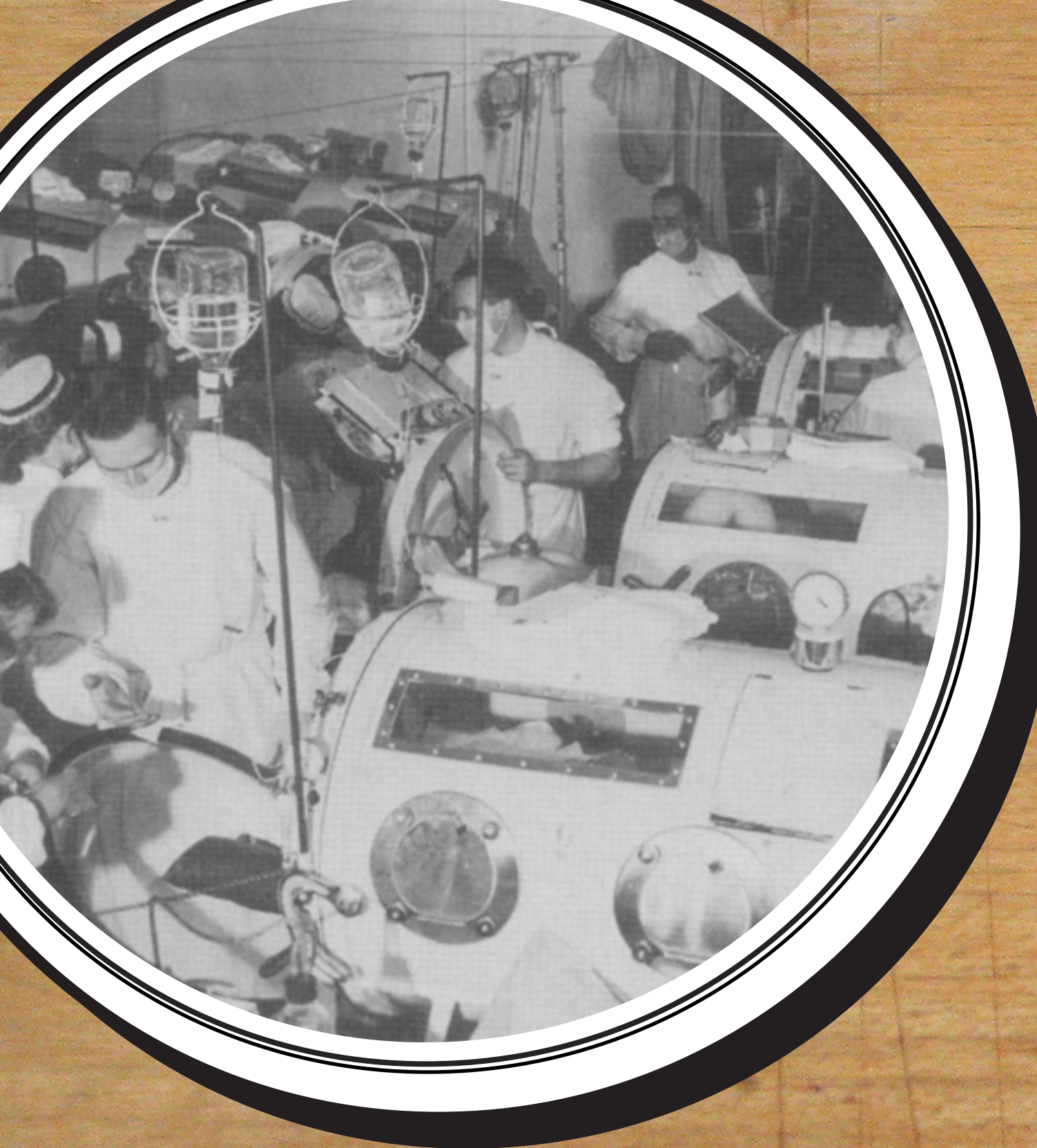
*THE DIME BECAME THE  
EMBLEM OF THE FIGHT  
AGAINST POLIO.*



IN 1946 ROOSEVELT'S IMAGE  
WAS PUT ON THE DIME.







HALF OF THE FOUNDATION'S  
INCOME STAYED IN LOCAL  
COMMUNITIES TO HELP CARE  
FOR POLIO VICTIMS.

\$233 MILLION RAISED FOR  
PATIENT CARE.

***80% OF THE NATION'S POLIO PATIENTS  
RECEIVED HELP FROM THE FOUNDATION***

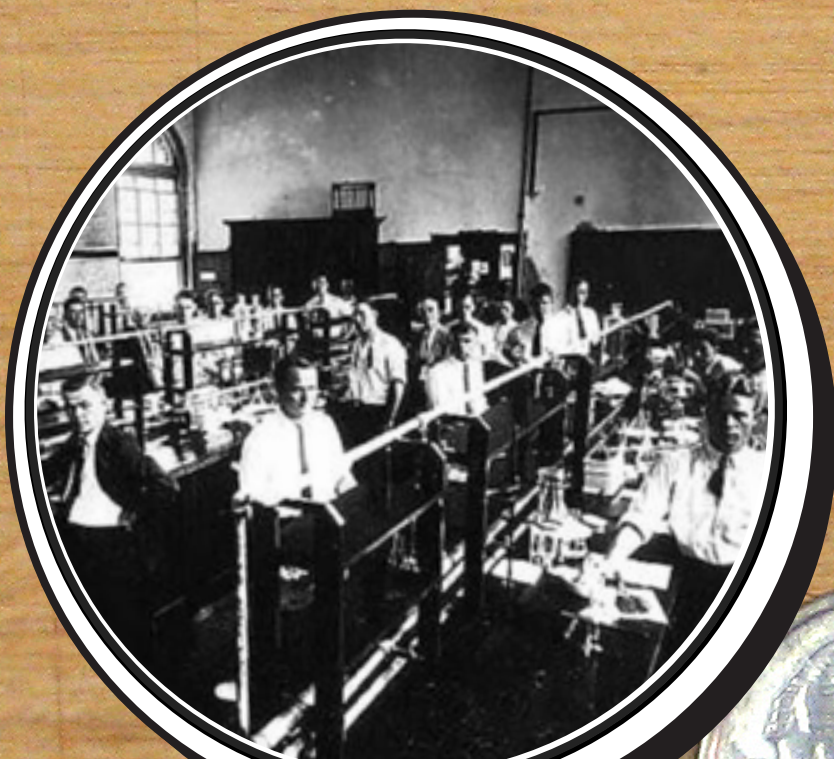






HALF OF THE FOUNDATION'S  
MONEY WENT TO NATIONAL  
ORGANIZATION WHICH FUNDED  
RESEARCH.

1934-1946: RESEARCH WAS  
UNDIRECTED AND SCATTERED





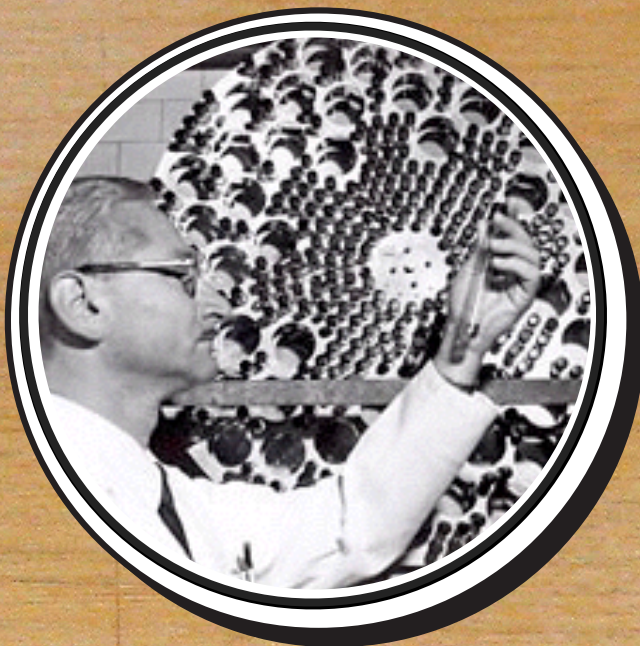
IN 1946 HARRY WEAVER BECAME  
RESEARCH DIRECTOR FOR THE  
NATIONAL FOUNDATION



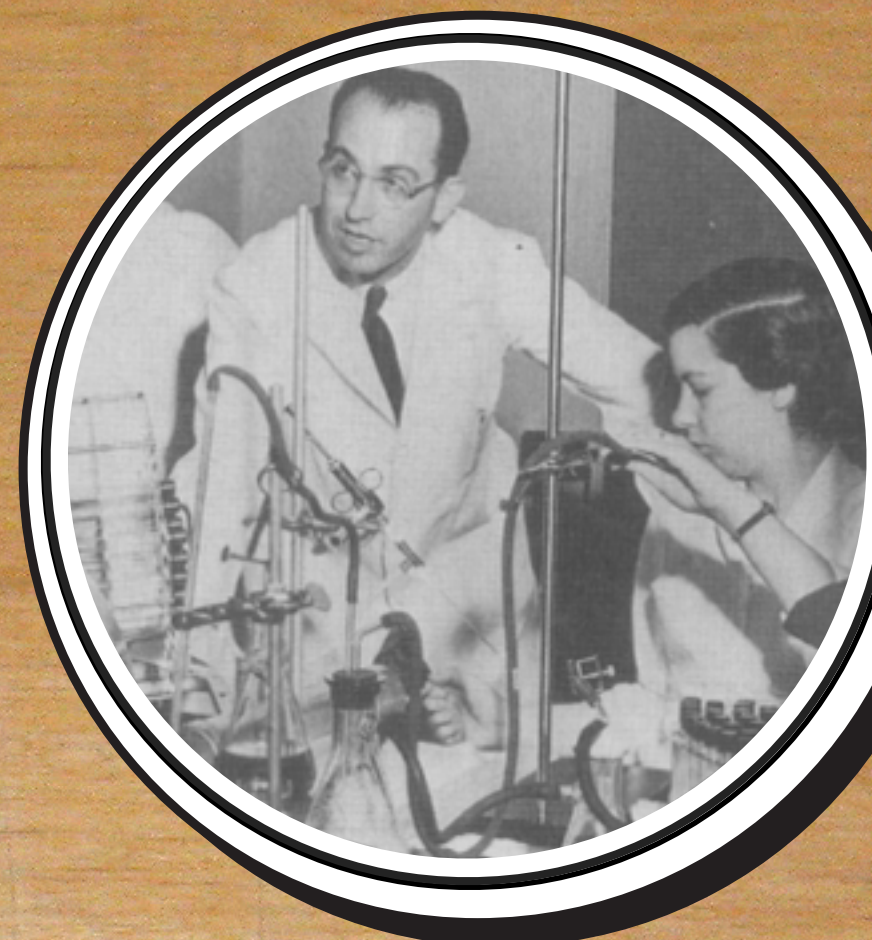




**BASIL O'CONNOR-**  
MASTER FUND-RAISER



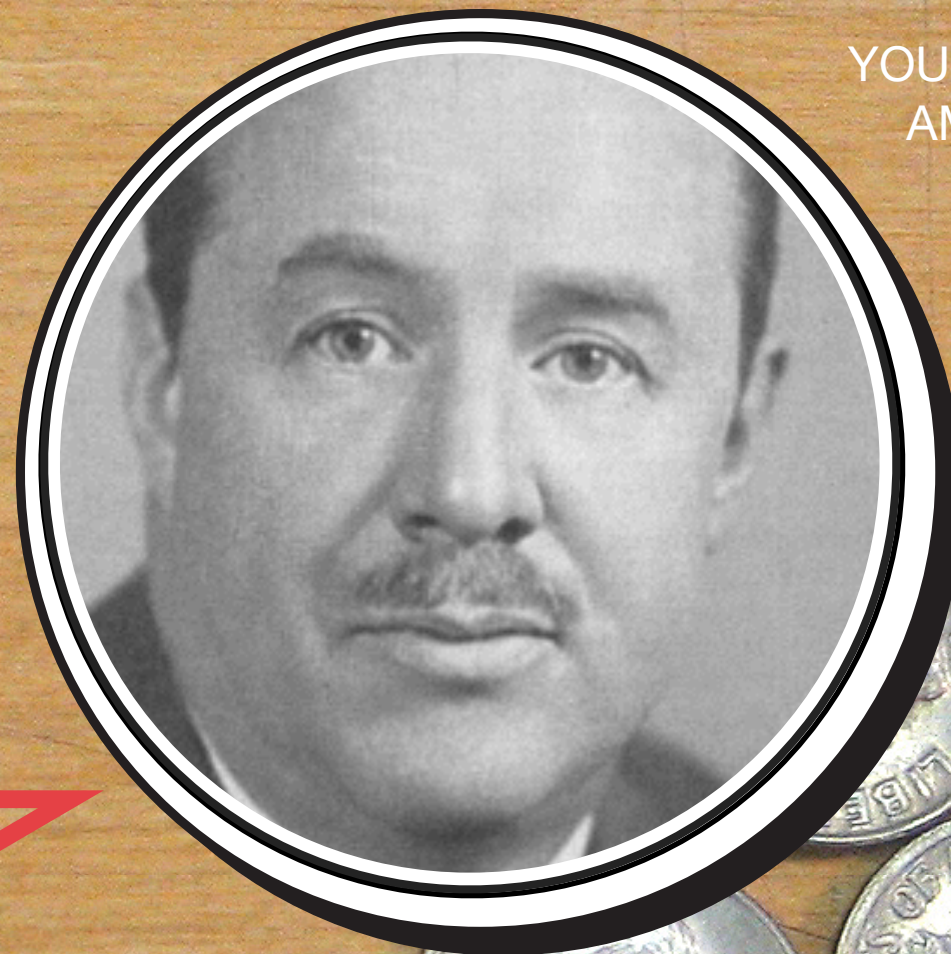
**ALBERT SABIN-**  
LEADING SENIOR RESEARCHER & SCIENTIST



**JONAS SALK-**  
YOUNG TURK-REBELLIOUS,  
AMBITIOUS, TALENTED



**HARRY WEAVER-**  
SAVVY DISTRIBUTOR OF FUNDING



**TOMMY FRANCIS-**  
EPIDEMIOLOGIST

**DEVELOPMENT OF  
THE POLIO VACCINE**

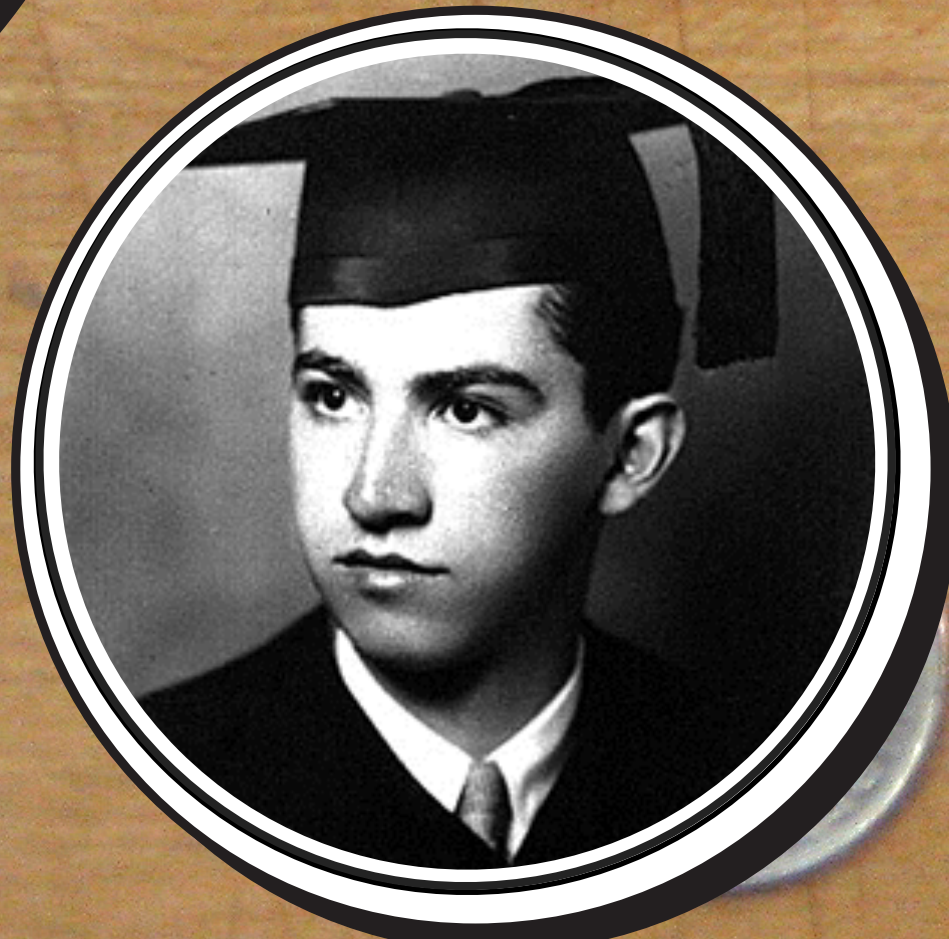




# SALK WAS FROM A LOWLY BACKGROUND



1. BORN IN NEW YORK IN 1914 TO JEWISH IMMIGRANTS
2. FIRST IN FAMILY TO GO TO COLLEGE
3. DISCRIMINATED AGAINST BECAUSE HE WAS JEWISH
4. BRILLIANT CHILD PRODIGY-WENT TO COLLEGE WHEN HE WAS 15





# FOUR KEY FACTORS IN SALK'S CREATIVITY



## EXTERNAL FACTORS -

1. MENTORSHIP - TOMMY FRANCIS
2. COMPETITIVENESS - ALBERT SABIN

## INTERNAL FACTORS -

3. CRAFT - IMPORTANCE OF GRUNT WORK
4. EXTRAPOLATION - PREDICTION/EXTENSION







Mentorship-  
From 1942-1947 Salk  
worked with Tommy  
Francis, a top  
epidemiologist who headed  
the program at the  
University of Michigan.







+Francis got to know Salk at Mount Sinai Hospital in New York.

+Francis hired him at the University of Michigan in 1942.

+Got him his army deferment so he could work on flu research.

+Taught him about vaccine research.

+Planted notion of killed virus vaccine firmly in Salk's head.





By 1947 Salk had taken over great responsibilities in the lab but he thought he wasn't getting enough credit for work and not enough pay.

Francis was able to get him a raise and gave him more credit but Salk decided to venture out on his own, leaving for the University of Pittsburgh in 1947.







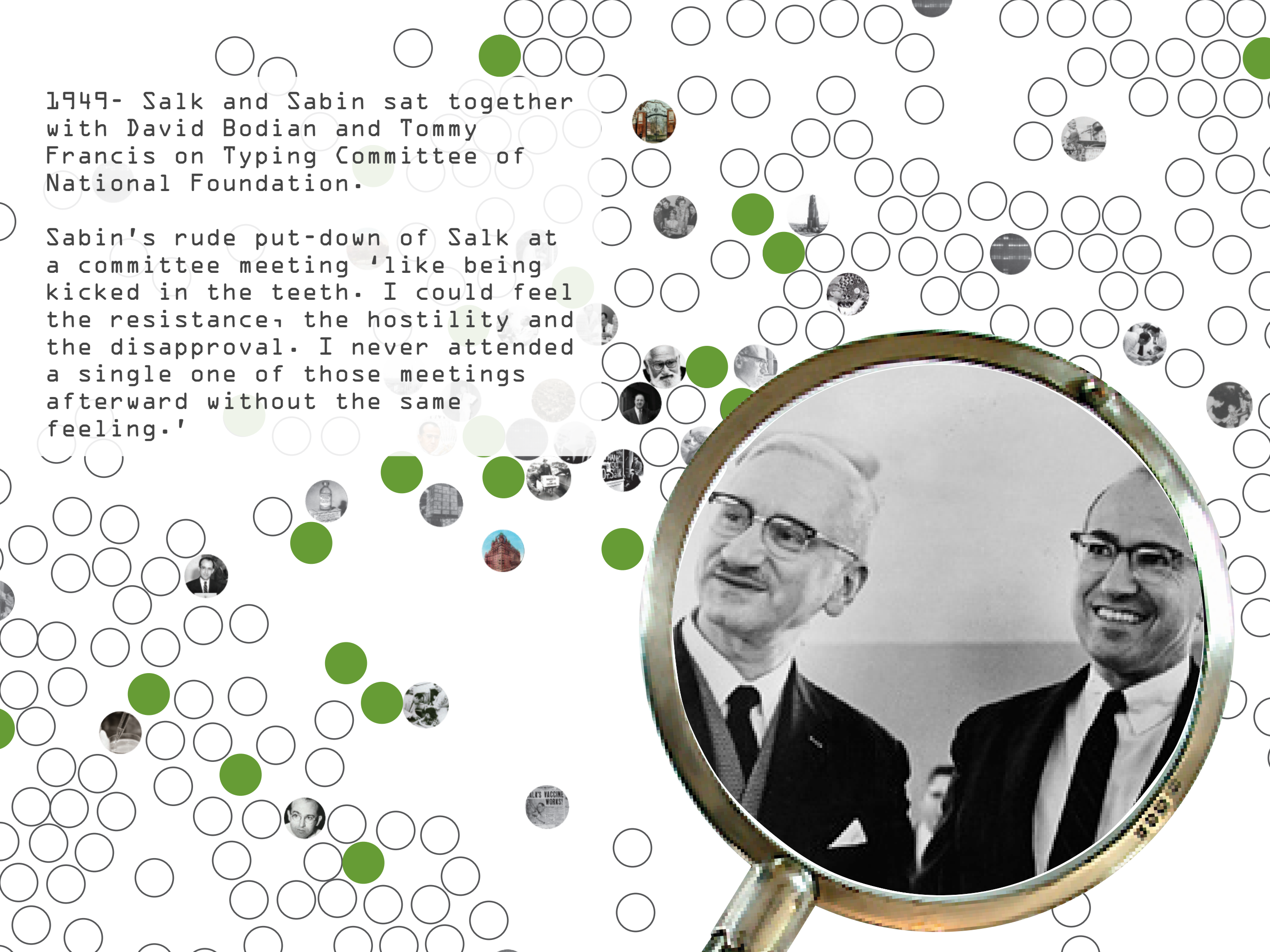
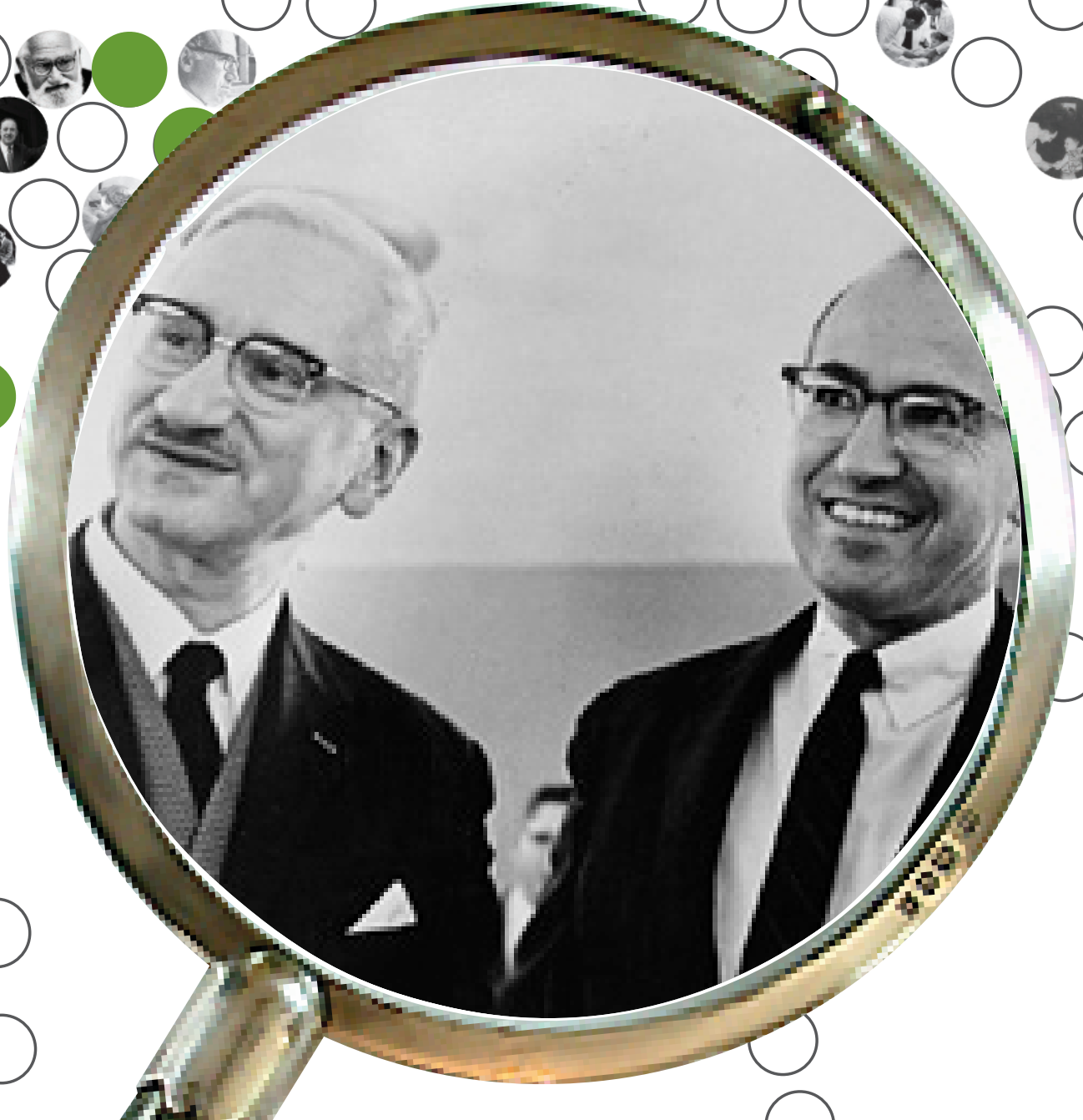
Competition-  
From 1947 to 1954 (and beyond)  
Albert Sabin was Jonas Salk's  
nemesis- older, established,  
arrogant.



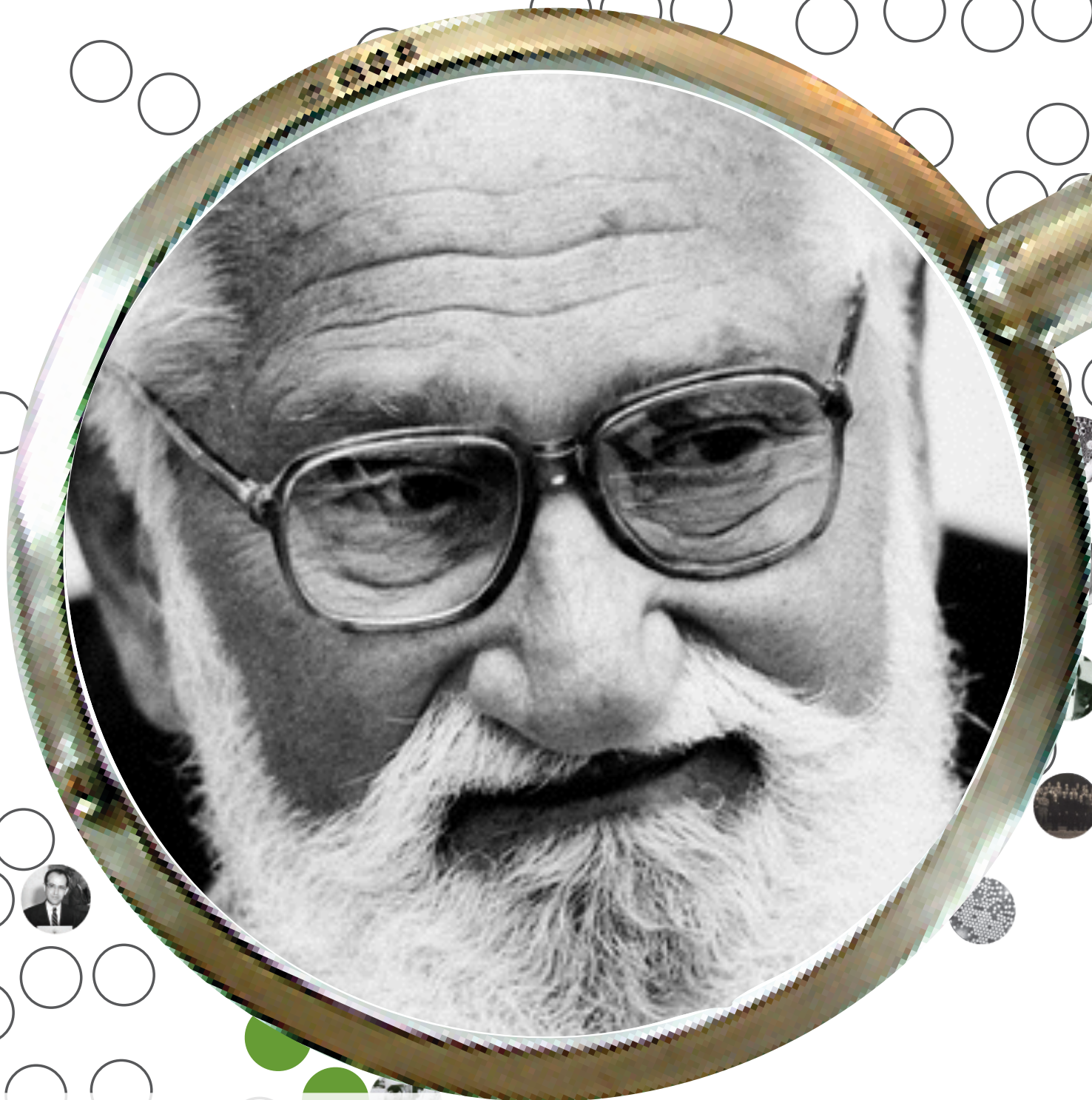


1949- Salk and Sabin sat together with David Bodian and Tommy Francis on Typing Committee of National Foundation.

Sabin's rude put-down of Salk at a committee meeting 'like being kicked in the teeth. I could feel the resistance, the hostility and the disapproval. I never attended a single one of those meetings afterward without the same feeling.'







'Sabin didn't think much of Salk and never would. He viewed him as an errand boy for the National Foundation.'

Sabin even disputed Salk's findings in the Typing study (although he knew far less about the topic than Salk at that point).





SALK WAS THE UNDERDOG

SALK HAD NOT WORKED AT THE PRESTIGIOUS 'ROCKEFELLER INSTITUTE' AS SABIN HAD - NO LINKS TO HARVARD, JOHNS HOPKINS OR YALE.

HE WAS MAROONED IN PITTSBURGH. HE DID NOT FIT IN AND WASN'T PART OF THE CLUB.





SABIN FAVORED THE LIVE-VIRUS VACCINE- HE THOUGHT IT WOULD LAST LONGER AND NO BOOSTER SHOT WOULD BE NEEDED.

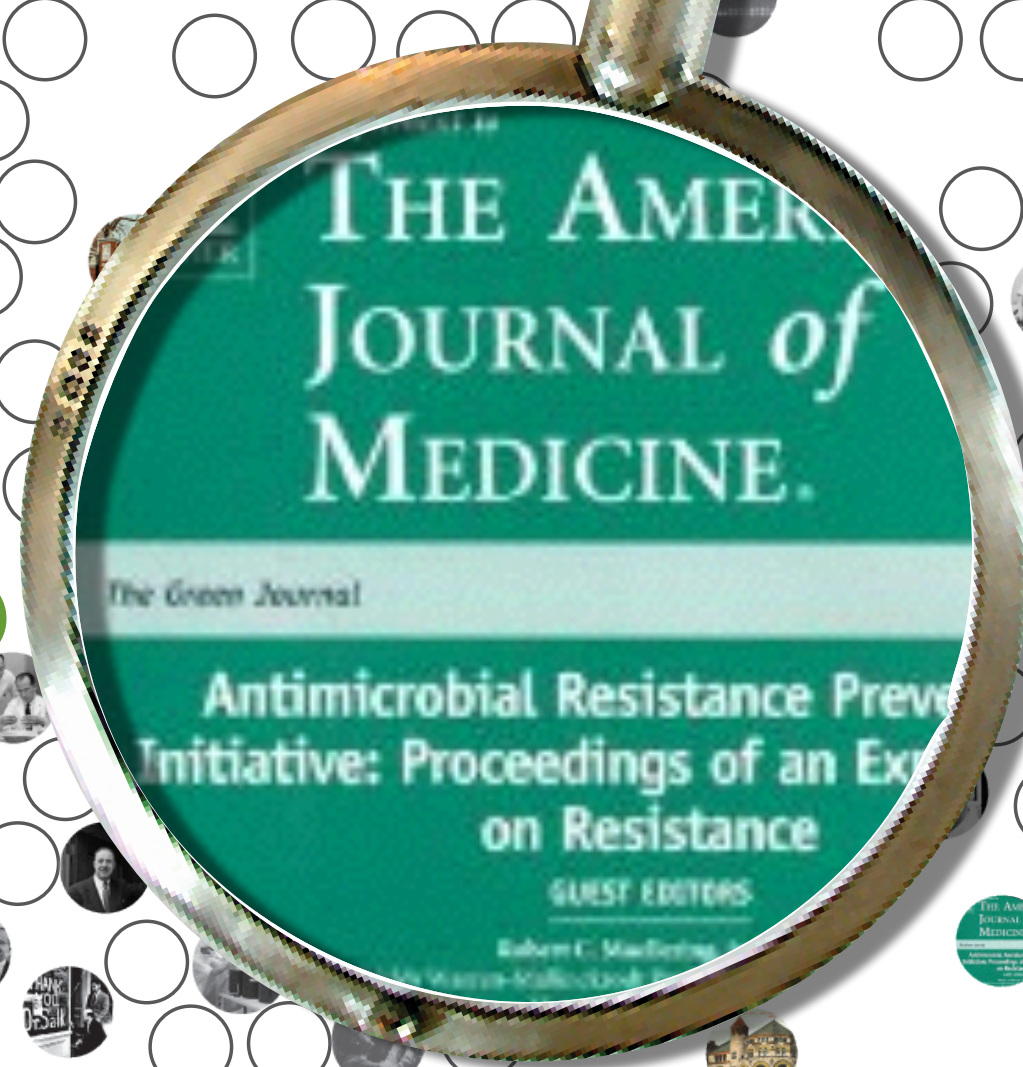
HE ESCHEWED PUBLICITY AND THE LIMELIGHT-LOOKING DOWN ON SCIENTISTS PARTICIPATING IN FUND-RAISING OR HEALTH POLICY.

SABIN REFUSED TO BE INFLUENCED BY FORCES OUTSIDE THE SCIENTIFIC COMMUNITY.





SABIN RIDICULED SALK FOR PARTICIPATING WITH THE WORLD OUTSIDE SCIENCE.



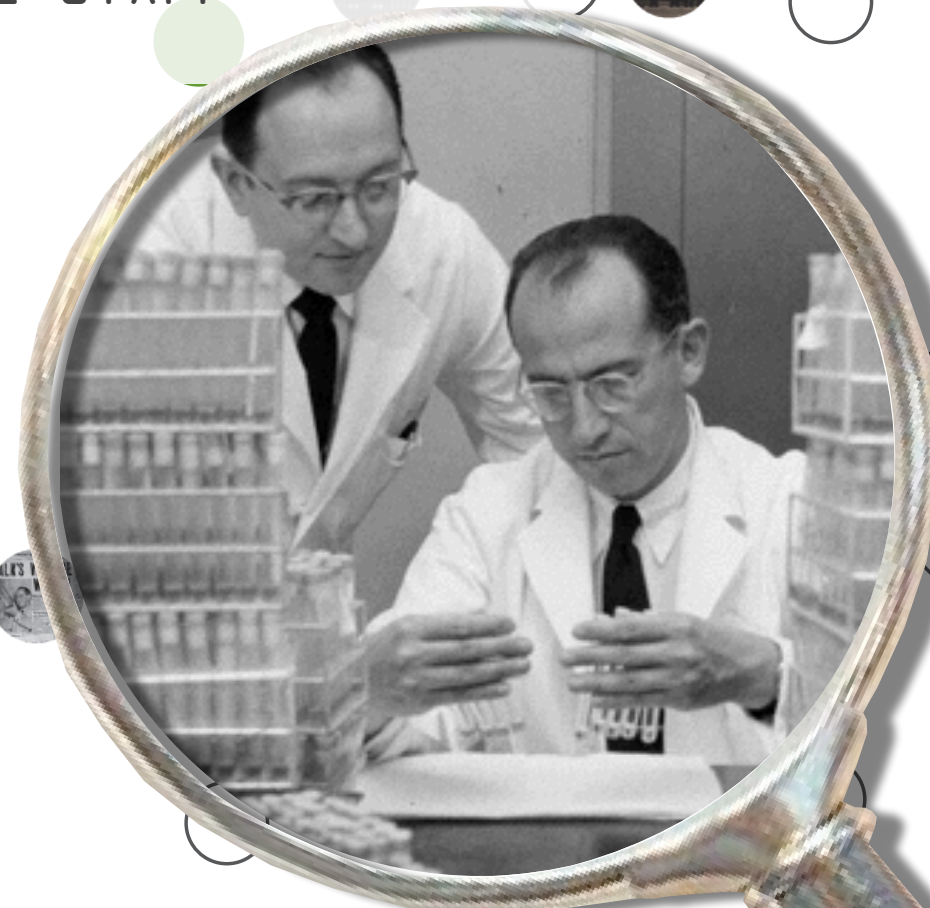


INTERNAL FACTORS:

**CRAFT**-IMPORTANCE OF SALK'S TYPING STUDIES  
DONE FROM 1949-1953, RESULTING IN  
\$1,250,000 IN GRANTS FROM THE NATIONAL  
FOUNDATION.

TYPING STUDY WAS MOSTLY GRUNT WORK TO  
CONFIRM THESE WERE THREE TYPES OF POLIO  
VIRUS.

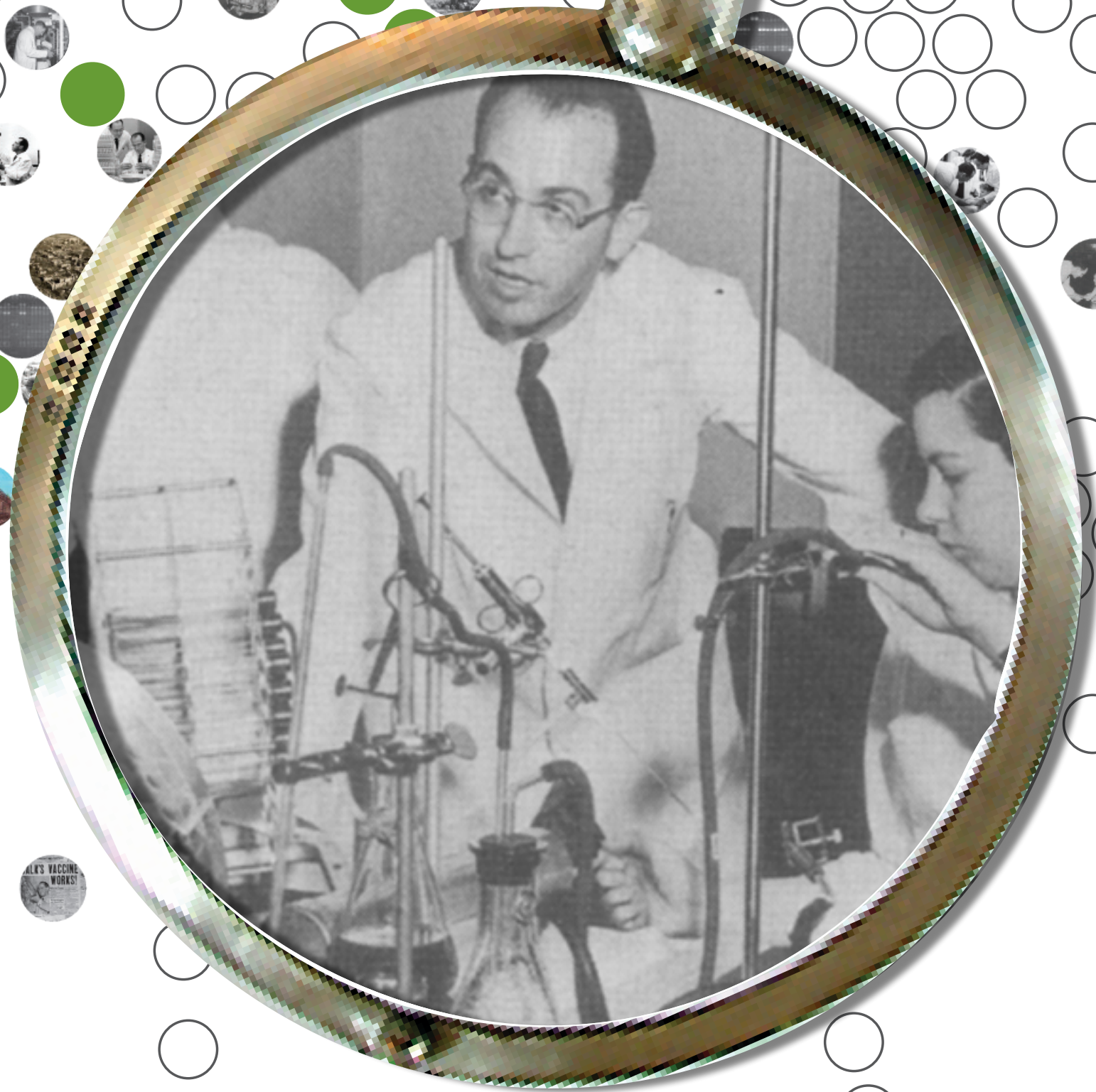
THIS INVOLVED MIND-NUMBINGLY REPETITIOUS  
PROCEDURES REQUIRING A LARGE STAFF.





SALK COULD SEE THAT THESE YOEMAN TASKS  
WOULD GIVE HIM ESSENTIAL KNOWLEDGE ABOUT  
THE VIRUS THAT COULD LEAD TO A VACCINE.

PAYING YOUR DUES- LEARNING YOUR CRAFT.







EXTRAPOLATION- SALK WAS A MORE OPEN, FREE-WHEELING THINKER THAN HIS PEERS. HE DID NOT HESITATE TO MAKE LEAPS, TO PREDICT.

'I ENGAGED IN EXTRAPOLATION BECAUSE I HAD ALWAYS FELT THAT IT WAS A LEGITIMATE MEANS OF PROVOKING SCIENTIFIC THOUGHT AND DISCUSSION. I ENGAGED IN PREDICTION BECAUSE I FELT IT WAS THE ESSENCE OF SCIENTIFIC THOUGHT. THE FACT THAT NEITHER EXTRAPOLATION OR PREDICTION WAS POPULAR IN VIROLOGICAL CIRCLES SEEMED TO ME TO BE A SHAME.' (P. 106)





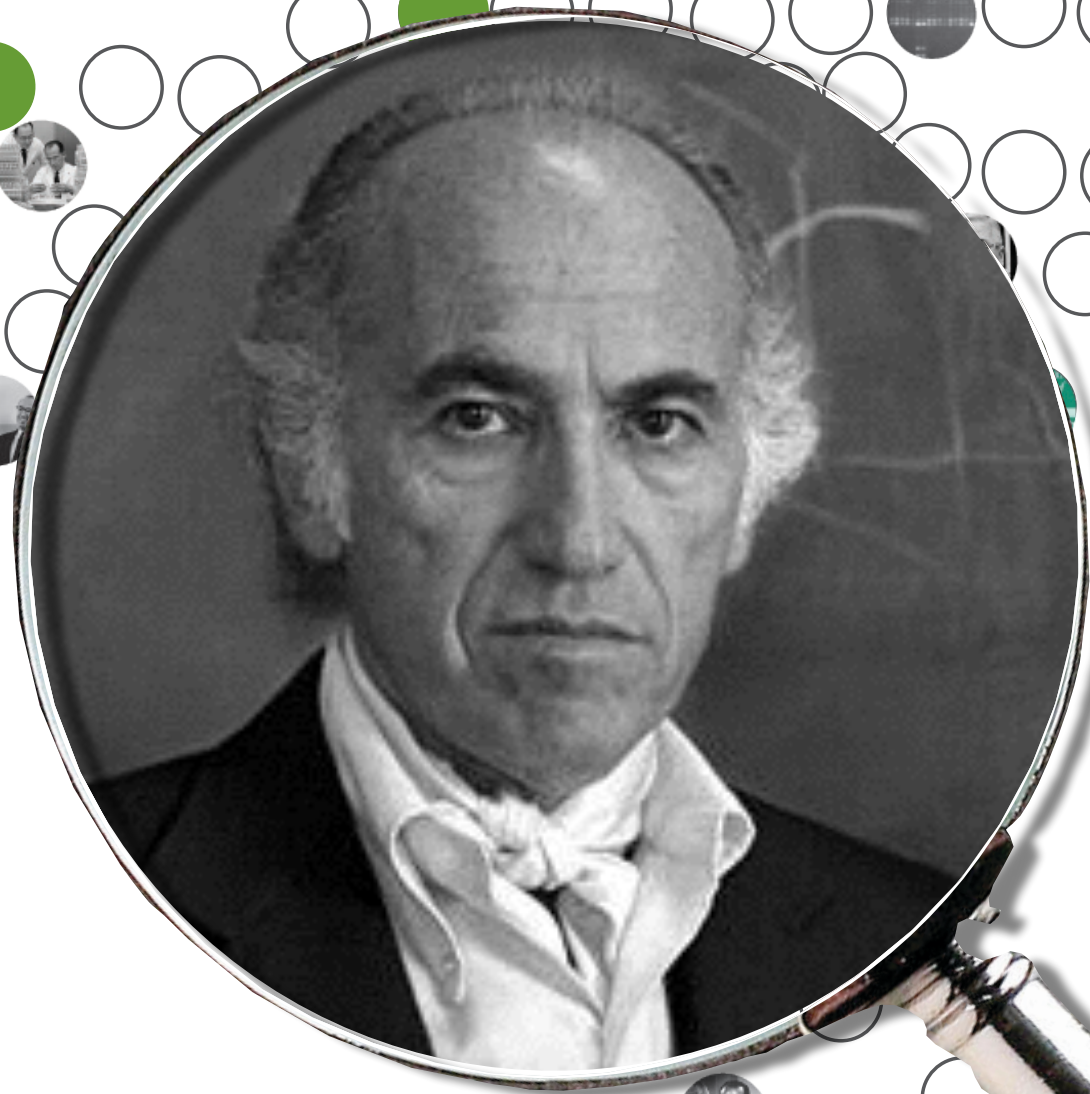
SALK'S CHARACTERISTICS:

OUTSIDER

RISK-TAKING

REBELLION

CONFIDENCE







SALK MOVES FROM TYPING STUDY TO PRODUCING VACCINE.

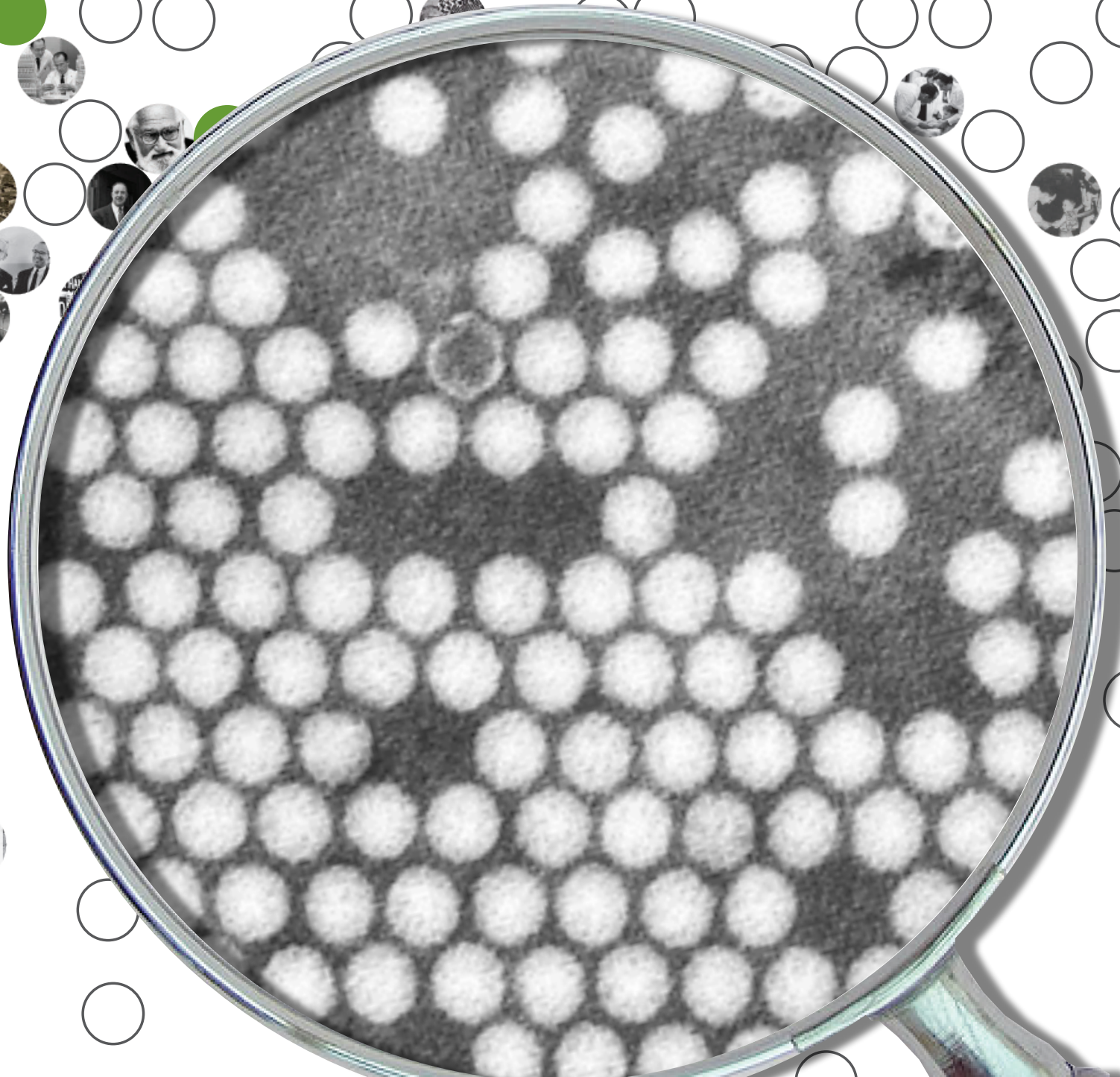
THE PROBLEM OF GROWING POLIO VIRUS WAS SOLVED BY OTHERS- AT FIRST IT WAS THOUGHT TO ONLY GROW IN MONKEY BRAINS (NEUROLOGICAL MATTER HAD SIDE EFFECTS FOR HUMANS)- LATER IT WAS SUCCESSFULLY GROWN IN THE KIDNEYS OF MONKEYS.





SALK TESTED CAREFULLY TO FIND JUST THE RIGHT STRAIN THAT WOULD BE:

- POWERFUL ENOUGH TO CREATE IMMUNITY
- DOCILE ENOUGH TO DO NO HARM



SALK TINKERED WITH FINDING THE BEST WAY TO KILL THE VIRUS FOR VACCINE:

FORMALDEHYDE AT RATIO OF 250:1

-TOO MUCH FORMALDEHYDE WOULD DILUTE THE VACCINE'S POWER

-TOO LITTLE WOULD GIVE PATIENT POLIO



DECEMBER 1951:

-SALK MAKES FIRST PRESENTATION  
OF SUCCESSFUL KILLED VIRUS  
VACCINE TRIALS IN MONKEYS.

-TIME FOR LIMITED HUMAN  
TESTING







JUNE 1952- TESTS IN A HOME FOR CRIPPLED CHILDREN (SUBJECTS ALREADY HAD POLIO) AND IN A HOME FOR MENTALLY RETARDED CHILDREN.

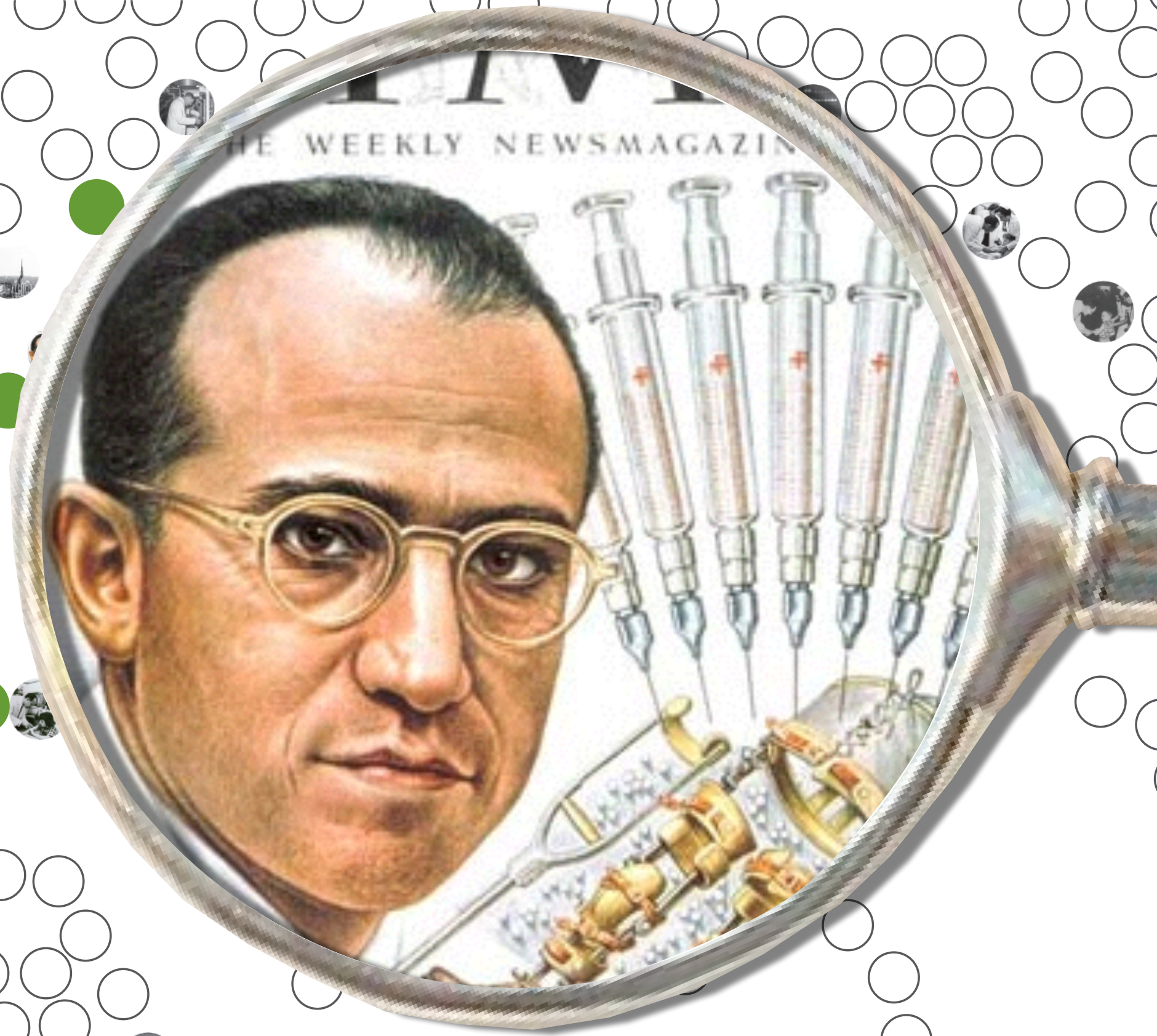
JUNE 1953- SALK REPORTS ON HUMAN TEST TO NATIONAL FOUNDATION IMMUNIZATION COMMITTEE





FEBRUARY 9, 1953 - ARTICLE IN TIME MAGAZINE  
IN WHICH SALK PREDICTS VACCINE.

SABIN THREATENS SALK.



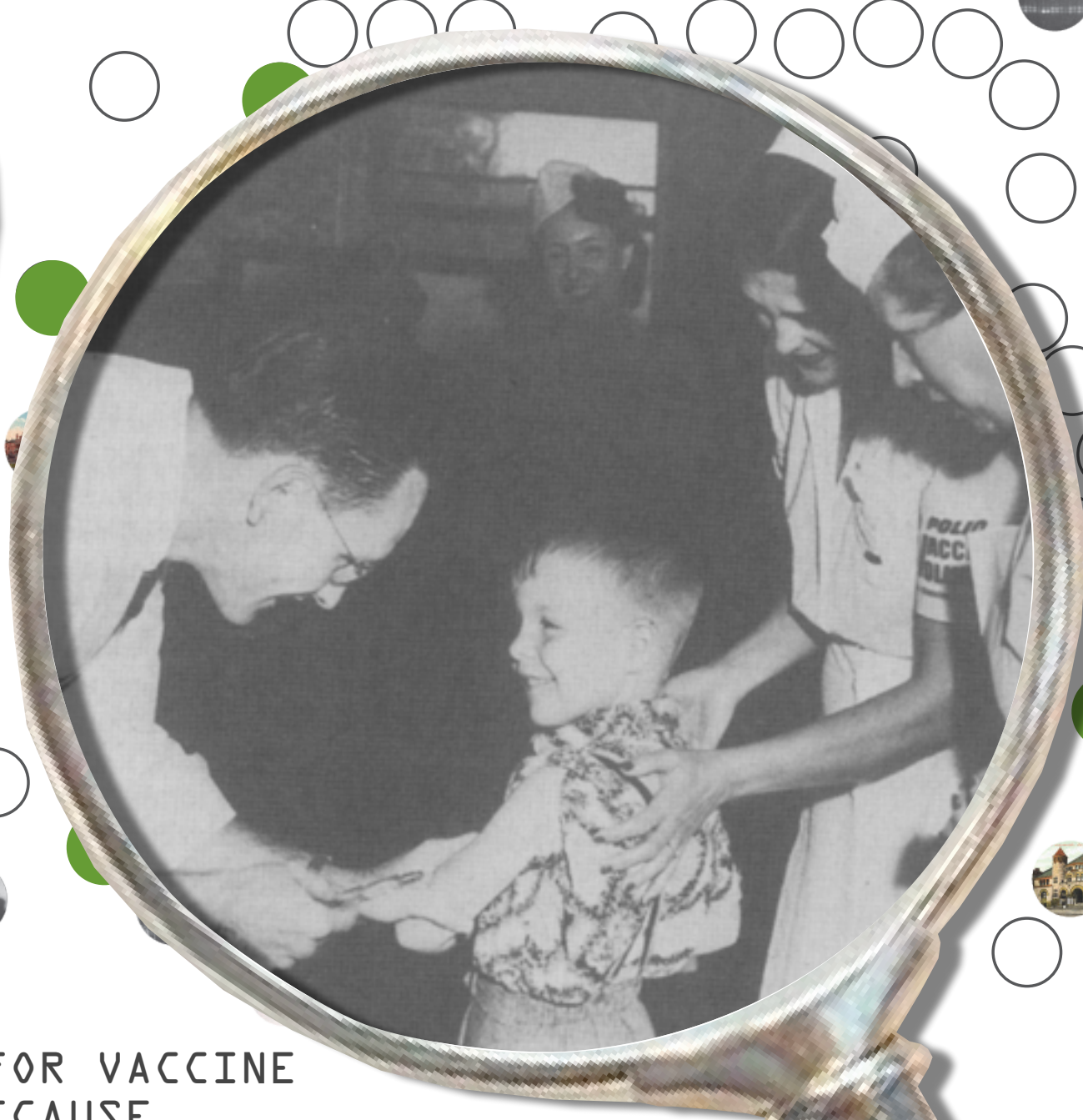




FEBRUARY 1953- O'CONNOR HAS  
SALK PRESENT TO AN ELITE GROUP  
OF JOURNALISTS AT THE WALDORF  
ASTORIA.

MARCH 26, 1953- SALK APPEARS  
ON NATIONALLY TELEVISED CBS  
PROGRAM- A 15 MINUTES DETAILED  
ACCOUNT OF HIS WORK.





REAL TEST TRIAL FOR VACCINE  
HAD TO BE HUGE BECAUSE  
INCIDENCE OF POLIO WAS ONLY 50  
IN 100,000.

1954- 600,000 CHILDREN WERE  
VACCINATED- 95% GOT ALL THREE  
DOSES DEEMED NECESSARY.

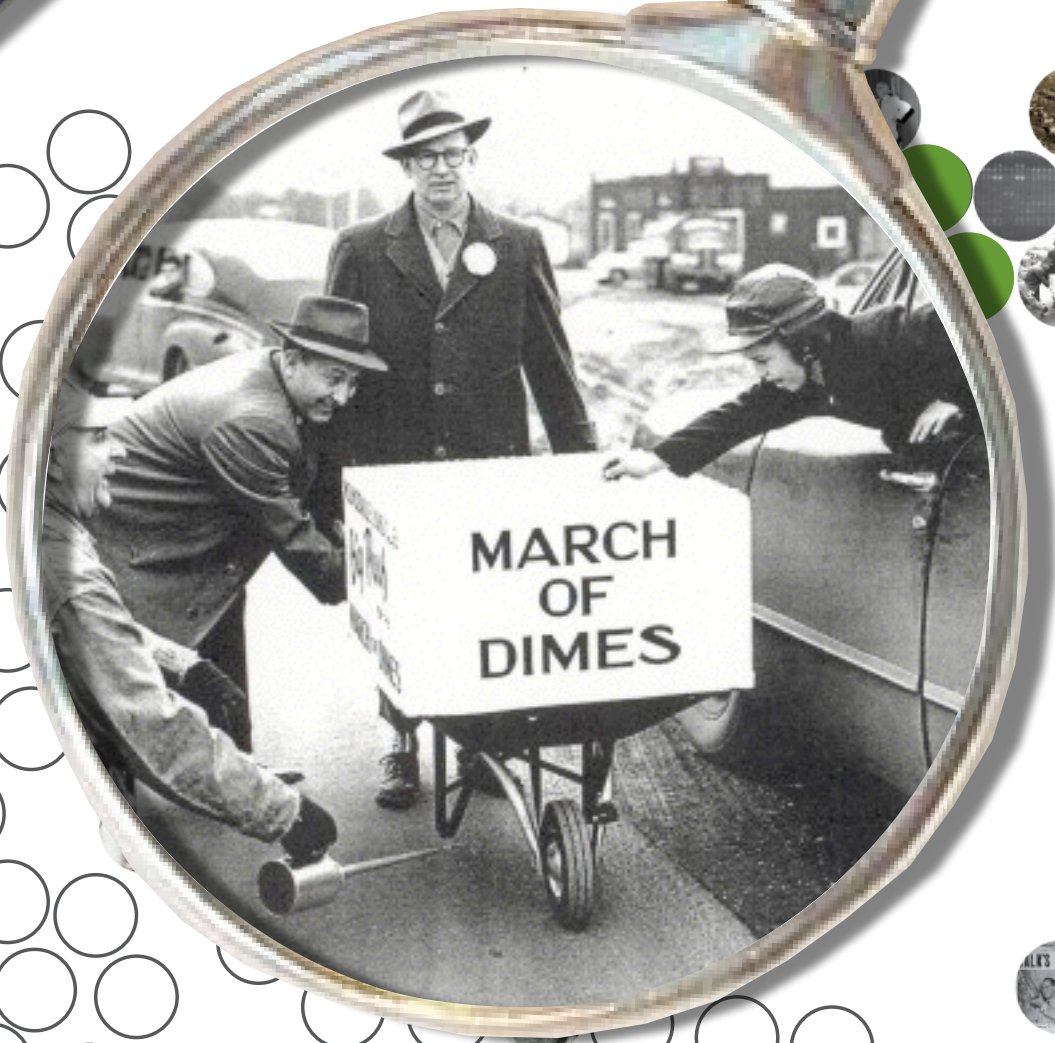
1,200,00 CHILDREN  
PARTICIPATED- HALF IN PLACEBO  
GROUP (SALK WAS AGAINST THIS)



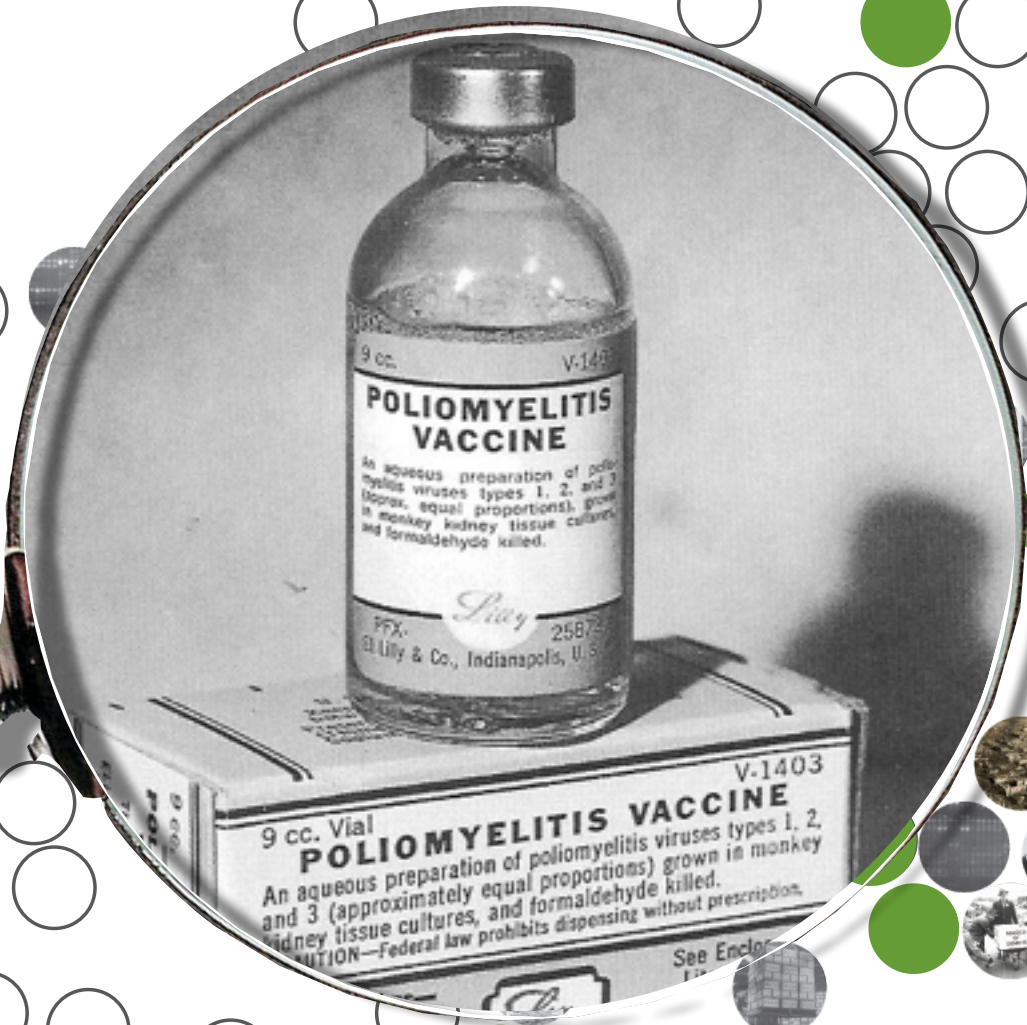


BY 1954, 2/3 OF THE NATION HAD  
DONATED MONEY TO THE MARCH OF  
DIMES. 7,000,000 PEOPLE HAD  
VOLUNTEERED TIME.

IT WAS A HERCULEAN PUBLIC EFFORT.







TOMMY FRANCIS' LAB AT THE UNIVERSITY OF MICHIGAN WAS TASKED WITH EVALUATING SALK'S FINDINGS.

THE VERIFICATION TOOK A YEAR.







MARCH 1955-  
ANNOUNCEMENT OF SUCCESSFUL RESULTS.

SALK BECAME VERY FAMOUS

- COVER OF TIME MAGAZINE
- EDWARD R. MURROW INTERVIEW





SABIN CONTINUED HIS WORK, THAT HE HAD BEGUN IN 1951, OF DEVELOPING A LIVE VIRUS VACCINE.

-HARDER TO ATTENUATE THE VIRUS THAN TO KILL IT.

1959-  
SABIN TESTS VACCINE IN THE USSR.



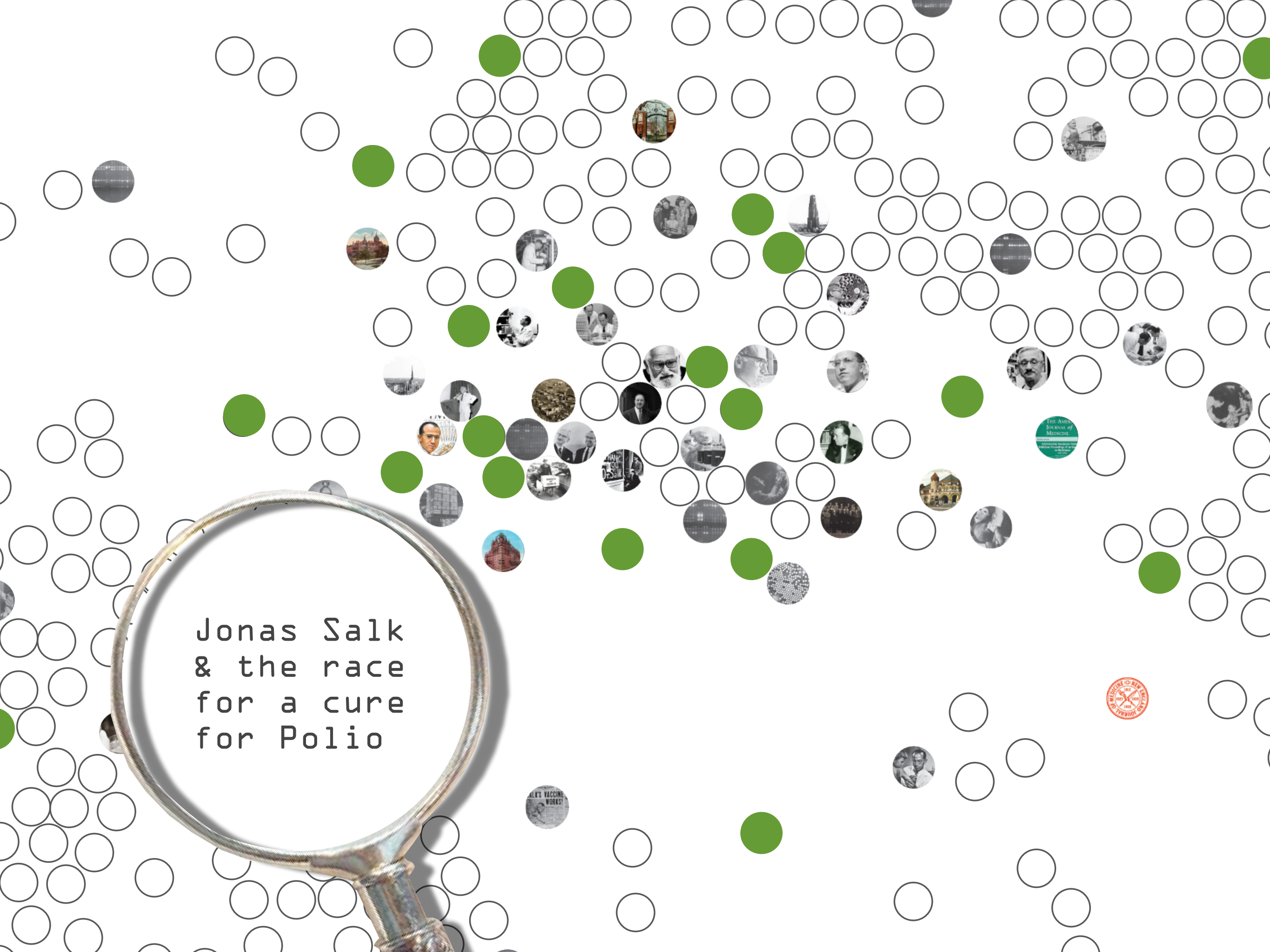




THANK  
YOU  
Dr. Salk







Jonas Salk  
& the race  
for a cure  
for Polio

