

CYCLOTRON

1940

2050 Univ California

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Relatively new and unfamiliar instrument - Sadashige
- amplify docket description

Whirlpool under magnetic & electric forces

Essential parts

- 1) Magnet
- 2) Electric power source (not much seen)
- 3) Chamber - thin pill box

Pictorial summary

#1	4" chamber	- Jan. 1930	- 80,000 volts	-	#25
#2	9"-11"	- 1931	.5-1.2 mev.	-	#800
#3	27½"-37½"	- 1932-9	1.24-5-9 mev	-	#20,000
#4	60"	- 1937	16 mev	- 2000	- #350,000

6 steps of growth

4"	to 60"	pole face	= 15 times
80,000	"	16 mev	= 200 "
$\frac{1}{1000}$	"	150 microamps	= 150,000 "

present proposed step

25	times	on power
20	"	" tonnage
10-20	"	" voltage
5	"	" money
3	"	" pole face

1) Add few facts to sum up case for feasibility

- 1) Practically all commercially available
- 2) Each unit designed and checked by experts.
- 3) Lawrence's own record.

2) Grant feasibility - why important?

(2)

Question roots back to fundamental purpose of physical science

Most important modern help in answering questions

What is this world made of - what are the ultimate parts - what laws do they obey?

Method physicist uses is, after all, not so strange, for it is the method discovered in every age by all small boys

To find how a thing is made - break it into pieces

Fire projectiles at atom

nucleus + 1	planetary electron - hydrogen
+ 2	helium
3	lithium
⋮	
92	uranium

marble plus one

hydrogen is ~~an~~ ^{was} in Grand Central Station

Present energies suffice only for ~~wasps~~ ^{electrons} - and to do relatively superficial damage to core

Importance of core

locus of energy

source of characteristic differences

origin of tantalizing problem - mesotron

unknown territory

Main point - attack on this central mystery of physical science

Secondary points

new radioactive materials

more efficient on old 100 - 3000

efficiency of larger machine

possible usefulness of radiations

3) But if feasible and important, why Berkeley

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- 1) experience
- 2) manufacturing facilities
- 3) site both close and safe
- 4) \$250,000 + ten x \$85,000
in addition to present Radiation Lab. budget
of \$70,000 California \$22,000
 Nat. Cancer 23,000
- 5) Group
- 6) Lawrence Bohr story

Alternative proposals

Characteristic opportunity to make discontinuous change
in rate of progress of science.

shrewd intelligence

imagination and insight

unselfishness

inspiration for young men

charm of personal character