

1  
00:00:10,269 --> 00:00:13,939  
WHEN YOU HEAR THE NAME HUBBLE, YOU PROBABLY  
THINK ABOUT THE TELESCOPE.

2  
00:00:13,939 --> 00:00:18,649  
BUT ALMOST A CENTURY AGO, THAT NAME WAS SYNONYMOUS  
WITH ONE OF THE MOST PREEMINENT ASTRONOMERS

3  
00:00:18,649 --> 00:00:21,339  
OF THE DAY... EDWIN HUBBLE.

4  
00:00:21,339 --> 00:00:28,028  
Owen Gingerich: "He was certainly one of  
the leading observational astronomers of the

5  
00:00:28,028 --> 00:00:34,869  
20th Century. If you had to pick sort of  
the leading observer, Hubble would be in competition

6  
00:00:34,869 --> 00:00:36,279  
for first place.

7  
00:00:36,280 --> 00:00:43,000  
BORN ON NOVEMBER 20, 1889 IN MARSHFIELD, MISSOURI,  
THE FOCUS OF THE FUTURE ASTRONOMER'S EARLY

8  
00:00:43,000 --> 00:00:45,929  
LIFE IS NOT ON THE SKY, BUT ON ATHLETICS.

9  
00:00:45,929 --> 00:00:51,119  
Dale E Christianson : "He capped a brilliant  
spring at the Northwestern University Interscholastic

10  
00:00:51,119 --> 00:00:58,119  
Meet on May 6, 1906, clearing the high bar  
at 5 feet 8 ½ inches. Hubble was hailed in

11  
00:00:58,609 --> 00:01:04,670  
the papers for establishing a new state record  
in the event. Dale E. Christianson, Author

12  
00:01:04,670 --> 00:01:09,310  
of Edwin Hubble, Mariner of the Nebulae"

13  
00:01:09,310 --> 00:01:14,490  
HUBBLE GOES ON TO PLAY CENTER FOR THE UNIVERSITY  
OF CHICAGO BASKETBALL TEAM... BUT HE... IS

14  
00:01:14,489 --> 00:01:20,199  
DRIVING TOWARDS ANOTHER GOAL... THE PRESTIGIOUS  
RHODES SCHOLARSHIP. IT'S AN HONOR BESTOWED

15  
00:01:20,200 --> 00:01:24,399  
TO CANDIDATES WHO OFTEN BECOME FUTURE US PRESIDENTS  
AND CHIEF JUSTICES.

16  
00:01:24,399 --> 00:01:30,420  
Robert Andrews Millikan: "Seldom have I  
known a man who seems to be better qualified

17  
00:01:30,420 --> 00:01:36,509  
to meet the conditions imposed by the founder  
of the Rhodes scholarships than is Mr. Hubble.

18  
00:01:36,509 --> 00:01:39,929  
1923 Nobel Laureate Robert Andrews Millikan"

19  
00:01:39,929 --> 00:01:45,868  
THE RHODES COMMITTEE SELECTS HUBBLE AS ONE  
OF THE TWO AWARDED FROM THE STATE OF ILLINOIS.

20  
00:01:45,868 --> 00:01:51,209  
HE SPENDS THE NEXT 4 YEARS AT ENGLAND'S  
OXFORD UNIVERSITY... AN EXPERIENCE THAT FOREVER

21  
00:01:51,209 --> 00:01:52,310  
TRANSFORMS HIM.

22  
00:01:52,310 --> 00:01:58,740  
Don Nicholson: "He fell in love with the  
British way of doing things. Their accent...

23  
00:01:58,739 --> 00:02:01,809  
their riding britches, and the works."

24  
00:02:01,810 --> 00:02:06,659  
WHILE STUDYING LAW AT OXFORD, EDWIN CONFIDES  
TO HIS MOTHER HE IS GOING TO TAKE A DIFFERENT

25  
00:02:06,659 --> 00:02:07,469  
CAREER PATH.

26  
00:02:07,468 --> 00:02:13,098  
Edwin Hubble: "Work, to be pleasant, must  
be toward some great end, an end so great

27  
00:02:13,098 --> 00:02:18,689  
that dreams of it, anticipation of it overcomes  
all aversion to labor. If only I find some

28  
00:02:18,689 --> 00:02:25,689  
principle, for whose sake I could leave everything  
else and devote my life. Edwin Powell Hubble"

29  
00:02:25,699 --> 00:02:28,159  
FOR HUBBLE, THAT LIFE IS IN ASTRONOMY.

30  
00:02:28,159 --> 00:02:34,530  
Nicholson: "He saw the changes that were  
going on in astronomy. He got interested in it

31  
00:02:34,530 --> 00:02:38,919  
and the interest became pretty consuming."

32  
00:02:38,919 --> 00:02:43,949  
WHILE PURSUING HIS DOCTORATE AT THE UNIVERSITY  
OF CHICAGO, HUBBLE LANDS A JOB AT THE WORLD'S

33  
00:02:43,949 --> 00:02:49,419  
LARGEST TELESCOPE. Nicholson: A lot of spectroscopy  
has been done with it. My father discovered

34  
00:02:49,419 --> 00:02:54,869  
three of Jupiter's satellites. DON NICHOLSON'S  
FATHER, SETH, WAS ONE OF THE ASTRONOMERS ON

35  
00:02:54,870 --> 00:02:57,789  
STAFF DURING THE EARLY DAYS OF MOUNT WILSON....

36  
00:02:57,789 --> 00:03:02,459  
Nicholson: "Mount Wilson was, without a  
question, the preeminent observatory in the

37

00:03:02,460 --> 00:03:09,460  
world for about the first half of the last  
century. An observatory that was designed

38  
00:03:09,620 --> 00:03:16,620  
not to do that kind of thing that had been  
done for centuries before but the so called

39  
00:03:16,759 --> 00:03:23,759  
new astronomy. What we largely call cosmology  
today. No other observatory in the world had

40  
00:03:24,539 --> 00:03:29,979  
the equipment, had the staff that Mt. Wilson  
had."

41  
00:03:29,979 --> 00:03:35,489  
BUT HUBBLE'S CAREER AT MT WILSON HAS TO  
WAIT. EDWIN'S BELOVED ENGLAND IS ENTRENCHED

42  
00:03:35,490 --> 00:03:36,840  
IN WORLD WAR I.

43  
00:03:36,840 --> 00:03:42,349  
Christianson: "He was haunted by the images  
of the gifted young men he had known at Oxford...

44  
00:03:42,349 --> 00:03:47,479  
now their corpses lay scattered along the  
Western Front. Dale E. Christianson"

45  
00:03:47,479 --> 00:03:54,479  
HE JOINS THE ALLIED EFFORT BUT NEVER SEES  
COMBAT. EDWIN RETURNS HOME AND FOCUSES ON

46  
00:03:54,699 --> 00:03:57,789  
INTERSTELLAR CLOUDS OF DUST AND GLOWING GASES.

47  
00:03:57,789 --> 00:04:03,799  
Hubble: My program, in short, is an attempt  
to find all I possibly can concerning the

48  
00:04:03,800 --> 00:04:10,410  
nature, form, and location of the galactic  
nebulae and their relation to the stars involved.

49  
00:04:10,409 --> 00:04:12,520  
Edwin Powell Hubble"

50  
00:04:12,520 --> 00:04:18,410  
IN OCTOBER OF 1923, HUBBLE TURNS HIS ATTENTION  
TO THE ANDROMEDA NEBULA. HE DISCOVERS THE

51  
00:04:18,410 --> 00:04:24,370  
FIRST VARIABLE STAR IN THE NEBULA THAT COULD  
BE USED TO CALCULATE ITS DISTANCE FROM EARTH.

52  
00:04:24,370 --> 00:04:29,050  
HUBBLE ESTIMATES ANDROMEDA TO BE AT LEAST  
A MILLION LIGHT YEARS AWAY...

53  
00:04:29,050 --> 00:04:33,680  
HE THEN APPLIES THE SAME TECHNIQUE TO OTHER  
SPIRAL NEBULAE. AND DISCOVERS THAT OUR UNIVERSE

54  
00:04:33,680 --> 00:04:36,829  
EXTENDS FAR BEYOND OUR LOCAL MILKY WAY.

55  
00:04:36,829 --> 00:04:43,829  
Owen: These objects had to be at a very great  
distance larger than any distances that had

56  
00:04:44,050 --> 00:04:49,310  
been proposed up to that time. This was stunning  
announcement.

57  
00:04:49,310 --> 00:04:56,189  
WHAT'S MORE, HE FINDS THAT OUR IMMENSE UNIVERSE  
IS GROWING EVEN LARGER... THIS EXPANSION RATE

58  
00:04:56,189 --> 00:05:01,340  
IS LATER COINED THE HUBBLE CONSTANT. THIS  
NOTION OF AN EXPANDING UNIVERSE BECOMES THE

59  
00:05:01,339 --> 00:05:06,598  
FOUNDATION OF THE "BIG BANG" THEORY WHICH  
EXPLAINS HOW THE UNIVERSE BEGAN.

60  
00:05:06,598 --> 00:05:13,598  
Owen: "I think that having the Hubble Space  
Telescope really seals the fame for Edwin

61  
00:05:15,129 --> 00:05:22,129  
Hubble and it does keep his name in the forefront  
and it helps him to be one of those people

62  
00:05:24,228 --> 00:05:27,878  
that really gets remembered from the 20th  
Century."

63  
00:05:27,879 --> 00:05:33,210  
A CENTURY THAT'S SEEN BOTH A MAN AND A TELESCOPE  
NAMED HUBBLE... TRANSFORM OUR VIEW OF THE

64  
00:05:33,209 --> 00:05:39,870  
COSMOS FROM A SMALL AND STATIC ISLAND OF STARS  
TO A VAST AND GROWING OCEAN OF GALAXIES.

65  
00:05:39,870 --> 00:05:44,288  
FROM THE SPACE TELESCOPE SCIENCE INSTITUTE  
IN BALTIMORE, MD, I'M MARY ESTACION.