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Title : Science course unit 21

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#### PROGRAMME SEQUENCE LIST

CU S100/21 Tape No. 6LT/10077 Project No. 00520/1121 Date Recorded 17.8.1970.

Form VTR 591.38 591.5 591.47 1ST TX: 21.6.1971.

Producer: Nat Taylor

Seq.	Time	Footage	Sequence List	Sound Cue
1/	2152"		Pentz introduces the unit. He has a model which shows the imaginary <u>evolution</u> of building screws from an unspecialised screw and to screws of various shapes.	575.0184 of real animals.
	3'15"		Peggy Varley with a grass snake. Shot of the snake moving on table top. Varley uses a model of a snake's vertebral column to explain how snakes move.	This harmless snake 598.12
2/	4'35"		Varley discusses the role of the vertebrae using several animals as examples of its developement. Shot of <u>dogfish</u> . Varley explains the movements of the vertebrae which allow the fish to swim.	Varley, M.E. 597.41
	4 '45"		Shot of a gurnard fish.	terre de la companya
	4'55"		Shots of trout.	597.9
	5'15"		Shots of <u>Tiger Salamander</u> crawling on table top.	597.9
	5'30"		Shot of <u>Tiger Salamander</u> swimming in a tank. Varley points out the fish like swimming motion.	
	6'00"		Shots of grass snake in water tank. Varley points out the fish like swimming motion.	598.12 swim like fish.
3	6112"		Varley examines convergent evolution showing several examples. Shot of an <u>Ichthyosaur</u> a prehistoric reptile which went back to the water and came to closely resemble a fish.	But of course 568.15
	6121"		Shot of a <u>dogfish</u> . Varley compares <b>complete</b> morphological features of the dogfish and <u>Ich</u> thyosaur.	597.41
	6132"		Shots of Tunny and Mar(in fish	Varley, M.E.
	7'28"		Varley goes on to examine the evolution of walking limbs in animals. She uses a cast of an early reptile fossil to describe the probable walking movements of this animal.	

### S100/21

# Page ... 2....

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Seq.

4/

16'22"

PROGRAMME SEQUENCE LIST

Time	Footage	Sequence List	Sound Cue
7139"		Shots of a modern <u>lizard</u> . The arrangement of its vertebrae and limbs are seen to be similar to the early reptile.	598.112
8114"		Varley with a skeleton of a reptile. She discusses the limbs and vertebral column.	
8129"		Varley with a section of a reptile vertebral column. She bends it sideways with ease but finds it difficult to bend in other directions.	any other direction.
		Varley takes up motion of mammals.	now, the mammals
<b>9</b> <sub>20"</sub>		Shots of <u>greyhounds</u> running on a track. The dogs are shown in slow motion for part of the time.	599.74442 798.8
9'31"		Slow motion shots of a cheetah in full trun.	599.74428 Varley, M.E.
10'55"		Shot of a greyhound skeleton. Varley points out differences between this and a lizard skeleton. Varley takes particular note of the lumbar vertebrae which in the greyhound has evolved to allow up and down rather than sideway motion.	Variey, H.E.
11 140"		Shot of swimming <u>dolphins</u> . Swimming motion is an up and down movement of the tail as here too the vertebral column has evolved for up and down motion. Varley points out that this is another case of convergent evolution as the dolphin has taken on a fish like appearance.	
<b>9</b> 2 15"		Varley with a human skeleton she points out similarity of human and other vertebrae.	612.75
		Shot of a swimmer doing the <u>butterfly stroke</u> . Varley points out the <u>similarity</u> to dolphin motion. Varley discusses the developement of arms and	797.21
		hands to paddles for swimming. Shot of a cast of a fossil <u>Plesiosaur</u> which <u>developed</u> paddles for swimming.	568.16
14 • 15"		Shots of terrapins and turtles swimming.	598.13
14:36"			
<u>14.58"</u> <u>15'30"</u>		Shots of penguins swimming Shots of seals on land and in water. Varley with human skeleton. She uses it to show paddle action in swimming.	598.441 599.748 612.5
15:49"		Shot of swimmer doing front crawl in pool.	797.21

# S100/21

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PROGRAMME SEQUENCE LIST

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Seq.	Time	Footage	Sequence List	Sound Cue
4/	18 • 15"		Varley shows limbs of several animals who use them as flippers while swimming: She points out the origin of each in a 5 finger hand. Shots of penguin, seal, sealion, turtle, and dolphin flippers.	591.47 of modern technology.
5/	20102"		Stephen Rose discusses the chemical rather than morphological differences and similarities in animals. He points out that the biochemistry of all animals is very similar. He points out that the biochemistry of organisms must have evolved before their morphological differences and that they must all have a common biochemical ancestor.	591.192 Rose, Stephen
	20150"		Rose with a paper chromatograph showing a set of amino acids. He explains that these amino acids were not produced by living organisms.	547.3492
			Rose explains the operation of the Miller apparatus for simulating the origin of life. Rose has the apparatus set up and describes the	577.028
	22133"		experiment during which the above amino acids were produced.	577
	23109"		Shots of a snowflake and a virus. Rose briefly notes that the real difference between the two can be determined through biochemical analysis.	origin of these two
6/	23120"		Credits.	