CAMERA SCRIPT

ALEXANDRA PALACE, STUDIO 'A'

RECORDING NO.: VTM/6HT/70861

WEDNESDAY, 22 NOVEMBER 1972

PROJECT NO.: 00525/3021

O.U. REF.: A.303/6

OPEN UNIVERSITY - PROBLEMS OF PHILOSOPHY

LAWS OF NATURE AND EXPLANATION

EXECUTIVE PRODUCER.....PETER SCROGGS

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SENIOR CAMERAMAN.....GORDON BLOCKLEY

CREW.....ONE

MAKE-UP ASSISTANT.....LAURIE WHEELER

TAKING PART

PROFESSOR R.B. BRAITHWAITE

K.K. BAUBLYS

DR. OSWALD HANFLING (OU)

SCHEDULE

CAMERA REHEARSAL.....1030-1300*

TELECINE.....1030-1715

Photocall.....*from 1230

Lunch.....1300-1400

Line-up.....1400-1430

RECORDING (discontinuous).....1430-1545 } VTM/6HT/70861

Tea break.....1545-1615 }

RECORDING contd.....1615-1645 }

Tape change.....1645-1700

RECORDING (A.303/5).....1700-1715 VTM/6HT/70829

AUTOCUE from 1030

TECHNICAL REQUIREMENTS

CAMERA 1: Pedestal - zoom
CAMERA 2: " - turret
CAMERA 3: " - zoom
CAMERA 4: " - "

3 MICS (floor stand)
TAPE (7" spool)

AUTOCUE (on Cam. 2)

3 FLOOR MONITORS

TELECINE: 16mm from 1030 (3 inserts - approx 15"-20" ea.)

2 ROLLER CAPTION STANDS (to be hand operated): for 3 roller caps.

VT playback facilities 1430-1715 (no inserts)

TELEJECTOR SLIDES

NO.	SHOT	DESCRIPTION
1.	3	Laws of Nature and Explanation
2.	3	A discussion between R.B. Braithwaite Emeritus Knightbridge Professor of Moral Philosophy University of Cambridge and K.K. Baublys Lecturer in Philosophy University of Lancaster
3.	3	Introduced by Dr. Oswald Hanfling
4.	9	Boyle's Law
5.	10	Kinetic Theory of Gases - Boyle's Law
6.	11	Kinetic Theory of Gases - Charles' Law - Boyle's Law - The Pressure Law
7.	12	Kinetic Theory of Gases - Charles' Law - Boyle's Law The Pressure Law - Law applied to - Hydrogen - Helium
8.	13	Hydrogen Law applied to - H at pressure a - H at pressure b H at pressure c
9.	14	Kinetic Theory - Charles - Boyle - Pressure - Law applied to Ha - Hb - Hc
10.	18	Kenneth Baublys (ident.)
11.	AS DIR. SEQ.(1)	R.B. Braithwaite (ident.)
12.	19	Taking part were Prof. R.B. Braithwaite - Kenneth Baublys Dr. Oswald Hanfling
*13.	19	Production Patricia Hodgson
*14.	19	A production for The Open University - BBC-tv (c) The Open University 1972
FOR TAPE NO: VTM/6HT/70829:		
15.	3	Taking part were Professor R.M. Hare - Dr. A.J.P. Kenney Professor Godfrey Vesey
*16.	3	Production Patricia Hodgson
*17.	3	A production for The Open University - BBC-tv (c) The Open University 1972

* same TJs

ROLLER CAPTIONS - (all on cam. 4)

NO.	SHOT	DESCRIPTION
1.	16	A true contingent general propostion - Every A is B - whose generality is not limited to any particular regions of space or of time will be called by a person C a law of nature or natural law if...
2.	AS DIR.(2)	If the hypothesis that all men are mortal is regarded as supported solely by the direct evidence that men have died, then it will not be regarded as a law of nature; but if it is regarded as also being supported by being deduced from the higher-level hypothesis that all animals are mortal, the evidence for this being also that horses have died, dogs have died, etc., then it will be accorded the honorific title of "law of nature" which will then indicate that there are other reasons for believing it than evidence of its instances alone.
3.	"	Generally speaking,atrue scientific hypothesis will be regarded as a law of nature if it has an explanatory function with regard to lower level hypotheses or its instances; vice versa, to the extent that a scientific hypothesis provides an explanation, to that extent will there be an inclination to endow it with the honourable status of natural law.

RUNNING ORDER

SHOT	PAGE	DESCRIPTION	CAMS	TIMINGS
2.	1	TK.1: Open titles		
3.	1	TJs.1-3: Titles		
4.	1- 2	HANFLING: Intro.	2	
5.	2	TK.2: Kilt anim.		
6.	2	HANFLING: Link	2	
7.	2	TK.3: Chair/man anim.		
8.	2- 3	HANFLING: Bunch of keys demo.	2	
8.	3- 5	HANFLING: Link to 'Laws' seq.	2	
9.-14.	5- 6	TJs/H's v/o: 'Laws' seq.	2?	
15.-17.	6- 7	HANFLING: Recap/Link to discussion. Roller cap.	2,4	
18.-AS DIR.(1)	7	H. intros BAUBLYS/ BRAITHWAITE	1,2,3	
AS DIR.(2)	8	3-WAY discussion Roller caps	1,2,3,4.	
19.	8	TJs: End credits		

F/U

/S/B TK/

1. A
VT CLOCK

/RUN TK/

2. TK.1 (Dur: /MUTE/
Opening titles

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3. TJ.1
"LAWS OF NATURE & EXPLANATION"

TJ.2
"A discussion between..."

TJ.3
"Introduced by
Dr. Oswald Hanfling"

4. 2 A /HANFLING: Some of the things we know about
MS HANFLING the world we know to be true universally. We know that every case of so and so is a case of such and such, or that whenever a certain thing happens, a certain other thing happens. Within this knowledge we make an important distinction - a distinction

/S/B TK/ between what we might call universals of fact and universals of law. The important thing about universals of law is that we not only think them to be true, but to be

(TK NEXT)

(SHOT 4, on 2)

HANFLING contd: in some sense necessarily true. Take for example the fact that all

/RUN TK/ Open University students at Study Centre No. 999 wear a kilt. And consider what it wouldbe like if one of them were not to

5. TK.2 (Dur: 15"-20") wear a kilt./ /MUTE/
Film: Kilt animation

/S/B TK/

6. 2 A /There's nothing very remarkable in that.
MS HANFLING
/RUN TK/ By contrast, consider the law that all unsupported bodies fall to the ground. Here is an example of an event happening

7. TK.3 /Dur: 15"-20") in accordance with this law./ /MUTE/
Film: Chair falling anim.

(Chair falling/chap falling)

Let's see that again.

(Chair falling/chap suspended in mid-air)

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8. 2 A /Well, you see the kind of shock that that
MS HANFLING produces. You immediately know there must be some kind of television trickery going

(TJ NEXT)

(SHOT 8, on 2)

HANFLING contd: on. We would certainly want to say that human bodies and other such objects must fall to the ground. /Let's take an even more vivid example. Here's a bunch of keys. If I let them go, they fall to the ground. I'll try that again. Here's a bunch of keys. I let them drop. As I said, you know that trickery is involved./

The difference between the two kinds of universals comes out in our attitude to hypothetical propositions. If I know that all students at Study Centre No. 999 wear a kilt, this wouldn't lead me to say that if some other students were to join that Centre, they must also wear a kilt. By contrast, if the chair I'm sitting on were removed I would certainly say that I must fall to the ground. /Or, take this bunch of keys. I would certainly say that if I were to throw them out of the window (which I'm not going to do), they must fall to the ground./

What is it that makes the difference between the two kinds of universals? One account of the difference is given by Professor R.B. Braithwaite in his book, Scientific Explanation. And the account

(TJ NEXT)

(SHOT 8, on 2)

HANFLING contd: he gives forms part of his general conception of laws of nature and scientific explanation, two things that we shall be discussing in this programme. I'll try to give a brief summary of Braithwaite's account. An important place is given in it to the question of how a person acquires his knowledge of a natural regularity. If it is just a matter of observing a number of instances of A being associated with B, then it isn't, so far, a law of nature; and there is no necessity about it. If, on the other hand, his knowledge is deducible from some hypothesis, then it can be regarded as a law; and it gets its necessity because it follows logically from that hypothesis. For example, the proposition that all men are mortal can be called a law if it's regarded as deducible from the higher-level hypothesis that all animals are mortal. Why is the latter called higher-level? Not just because the proposition about all men can be deduced from it. But because other propositions which are, so to speak, on the same level as the one about all men can also be deduced from it; propositions

(TJ NEXT)

(SHOT 8, on 2) (A.303/6)

HANFLING contd: about horses, cats, etc. Of course, 'all men are mortal' is hardly the sort of thing that would occur to a scientist as a typical law of nature. Let's take something more true to life. I suppose one of the best know laws is Boyle's Law, concerning the relation between the pressure and volume of a gas. For our purposes we needn't worry about technicalities. Let's just put down the

9. TJ.4 "Boyle's Law"

name Boyle's Law./ Now Boyle's Law is deducible from the Kinetic Theory of Gases.

10. TJ.5 Kinetic/Boyle's

/And it's an important aspect of Braithwaite's account that this Kinetic Theory is higher level in the sense that one can also deduce from it some other laws besides Boyle's Law. There is no need to explain these.

11. TJ.6 +Charles' & Pressure Law

Law Charles' Law & the Pressure We can just put down their names:/ And from any one of these laws we can deduce more restricted law-like statements. Let's again take Boyle's Law, and this time work downwards from it. From Boyle's Law there follows a law-like statement about hydrogen,

12. TJ.7 +Law applied to Hydrogen & Helium

another about helium, and so on. /And then again, from these special laws we can deduce what would happen - what must happen - in particular instances; take Boyle's Law

13. TJ.8 +Law applied to Hydrogen, Ha, Hb, etc.

applied to hydrogen,/ from that we know

(TJ NEXT)

(SHOT 13, on TJ)

HANFLING contd: what must happen in an instance of hydrogen in condition A, in condition B, and so on. And the same for the other gases. Let me recap: an important aspect of Braithwaite's account is its concern with explanation. What happens with the instances of gases, and then again the special laws about gases, is held by him to be explained by Boyle's Law - and this is because they are deducible from it. And Boyle's Law, in its turn, and together with its companions, is held to be explained by the Kinetic Theory, because they are deducible from it. The Kinetic Theory itself will be explained if it in turn is deducible in the same sort of way from some yet higher level hypothesis, and so on. Whether there has to be some upper limit to this procedure, is a question we might consider later in the programme.

14. TJ.9
Summary chart

15. 2 A
3-S favouring BRAITHWAITE

/Now I have Professor Braithwaite in the studio with me to answer some questions and consider possible objections to his account. And to put the questions and objections, I've got with me Mr. Kenneth Baublys, Lecturer in Philosophy at the University of Lancaster. Perhaps we could start off by considering Prof. Braithwaite's criterion for calling

(4 NEXT)

(SHOT 15, on 2)

HANFLING contd: something a law of nature. And I'm thinking particularly of what he says in the passage reprinted on page 193 of our Reader, 'Fundamental Problems in Philosophy". He says:/"A true contingent general proposition - Every A is B - whose generality is not limited to any particular regions of space or of time will be called by a person C a law of nature or natural law if..." / - I won't go into the actual conditions, or into what it says about "regions of space and time". What I'm wondering about is the way it says "will be called by a person". That seems to make it relative to persons whether something is a law. Do you think that's all right, Ken?

16. 4 A
Rol. cap.1

17. 2 A
3-S favouring BRAITHWAITE

18. 1 A /
MS BAUBLYS

S/I
TJ.10
"Kenneth Baublys" - ident
T/O

AS DIRECTED (1):

(Short discussion & introduction of Braithwaite)

1 A a/b

2 A 3-S

3 A MS BRAITHWAITE
S/I
TJ.11
"R.B. Braithwaite" - ident
T/O

(AS DIRECTED (2) NEXT)

(SHOT 20, on 3)

AS DIRECTED (2): (3-WAY DISCUSSION)

1 A MS, MCU, CU BAUBLYS
2-S HANFLING/BAUBLYS
3-S

2 A MS, MCU, CU HANFLING
2-S HANFLING/BAUBLYS
or
HANFLING/BRAITHWAITE
3-S

3 A MS, MCU, CU BRAITHWAITE
2-s HANFLING/BRAITHWAITE
3-S

4 A ROLLER CAPS:
2. "If the hypothesis..."

3. "Generally speaking..."

19. TJ.12
"Taking part were..."

TJ.13
"Production Patricia Hodgson"

TJ.14
"A production for...

FADE SOUND & VISION

OPEN UNIVERSITY - [illegible].

(A.303/6)

Project No: 00525/3021

PROGRAMME TRANSCRIPT

PROBLEMS OF PHILOSOPHY - LAWS OF NATURE AND EXPLANATION

HANFLING: Some of the things we know about the world we know to be true universally. We know every case of so and so is a case of such and such, or that whenever a certain thing happens, a certain other thing happens. Within this knowledge we make an important distinction - a distinction between what we might call univerals of fact and universals of law. The important thing about universals of law is that we not only think them to be true, but to be in some sense necessarily true. Take, for example, the fact that all Open University students at Study Centre No. 999 wear kilts. And consider what it would be like if one of them were not to wear a kilt.

W/T - People all talking together.

HANFLING: Well, there's nothing very remarkable in that. By contrast, consider the law that all unsupported bodies fall to the ground. Here's an example of an event happening in accordance with this law.

W/T - Clatter, bang.

HANFLING: Let's just see that again.

W/T - Whistle, exclamation.

HANFLING: Well, you see the kind of shock that that produces. You immediate think there must be some kind of television trickery going on, as indeed there was. We would certainly want to say that human bodies and other such objects must fall to the ground. Let's take another example. Here's a bunch of keys -*/I let them drop. Well, as I said, you know that there is some trickery going on. The difference between the two kinds of universals, comes out in our attitude to hypothetical propositions.

* if I let go, they fall to the ground. Let's try that again. A bunch of keys - I let...

HANFLING: (cont'd) If I know that all students at Study Centre No. 999 wear kilts, this wouldn't lead me to say that if some other students were to join that centre, they must also wear kilts. By contrast, if the chair I'm sitting on were removed, I would certainly say that I must fall to the ground. Or again to take this bunch of keys, I would certainly say that if I were to throw them out of the window (which I'm not going to do) they must fall to the ground. What is it that makes the difference between the two kinds of universals? One account of the difference is given by Professor R.B. Braithwaite in his book, Scientific Explanation. And the account he gives forms part of his general conception of laws of nature and scientific explanation. Two things that we shall be discussing in this programme. I'll try to give a brief summary of Braithwaite's account. An important place is given in it to the question of how a person acquires his knowledge of a natural regularity.

HANFLING: (cont'd) If it's just a matter of observing a number of instance of A being associated with B, then it isn't so far a law of nature, and there's no necessity about it. If, on the other hand, his knowledge is deducible from some hypothesis, then it can be regarded as a law, and it gets its necessity because it follows logically from that hypothesis. For example, the proposition that all men are mortal can be called a law if it's regarded a deducible from the higher level hypothesis that all animals are mortal. Why is the latter called higher level? Not just because the proposition about all men can be deduced from it, but because other propositions which are, so to speak, on the same level as the one about all men, can also be deduced from it. Propositions about all horses, all cats, etc. Well, of course, 'all men are mortal' is hardly the sort of thing that would occur to a scientist as a typical law of nature, so let's take something a bit more true to life.

HANFLING: (cont'd) I suppose one of the best known laws is Boyle's law concerning the relation between the pressure and the volume of a gas. For our purposes we needn't worry about the technicalities of the law; let's just put down the name 'Boyle's Law.' Now Boyle's Law is deducible on the kinetic theory of gases, and it's an important aspect of Braithwaite's account that this kinetic theory is higher level in the sense that one can also deduce from it some other laws besides Boyle's Law. Again, there's no need to explain these, we can just put down their names - Charles' Law and the Pressure Law. And from any one of these laws we can deduce more restricted law-like statements. Let's again take Boyle's Law and this time work downwards from it. From Boyle's Law there follows a law-like statement about hydrogen, another about helium, and so on. And then again from these special laws we can deduce what would happen, what must happen, in particular instances. Take this Boyle's Law applied to hydrogen.

HANFLING: (cont'd) From this we know what must happen in an instance of hydrogen in condition A, in condition B, and so on. And the same for the other gases. Now an important aspect of Braithwaite's account is its concern with explanation. Let's just look again at the chart. What happens with the instances of gases, and then again the special laws about gases, is held by him to be explained by Boyle's Law. And this is because they are deducible from it. And Boyle's Law, in its turn, and together with its companions, is held to be explained by the kinetic theory because they are deducible from it. The kinetic theory itself will be explained if it, in turn, is deducible in the same sort of way from some yet higher level hypothesis, and so on. Whether there has to be some upper limit to this procedure is a question we might, perhaps, conside later in the programme. Now I have Professor Braithwaite in the studio with me to answer some questions and consider possible objections to his account, and to put the questions and

HANFLING: (cont'd) objections I've got with me Kenneth Baublys, Lecturer in Philosophy at the University of Lancaster. And perhaps we could begin by considering Professor Braithwaite's criterion for calling something a law of nature, and I'm thinking particularly of one passage in his book. It's re-printed on Page 193 of our reader ' 'Fundamental Problems of er Fundamental Problems in Philosphy' and it goes like this:- "A true contingent general proposition - every A is B - whose generality is not limited to any particular regions of space or time, will be called by a person C, a law of nature of natural law if ..." and then he gives some conditions. But I don't want to go into conditions at the moment, or for that matter, the bit about er regions of space and time. What I'm wondering about is the way it says "will be called by a person". Now this does seem to make the notion of a law relative to particular persons, and I'd like to ask, first of all, Ken whether you are happy with that notion?

BAUBLYS: Not entirely, no. Um on this account what is a law seems to depend on whether it's regarded by a person as a law, and this in turn, er depends on how that, the statement expressing the law gets into the rest of that person's belief, um beliefs. Um and it seems that er the implication, therefore, is that a particular statement might be both law-like and non-law like, depending on how a person regards it, relative to the rest of his beliefs, and in addition, um a statement might be non-law-like at one time, and then become law-like because it becomes incorporated into a theory. And this, I do find a rather odd feature on Professor Braithwaite's er account.

BRAITHWAITE: Yes, there certainly are consequences of my account, but the, my account was the way in which I gave my account, er was in order to do something to distinguish between er laws of nature and other universals er which did not require a different objective that they were saying someth.. er they were saying something different, if you like, about the World.

BRAITHWAITE: (cont'd) And in my account, therefore, you put it that er if you, that a law of nature was to make a universal generalisation er in such a way, in su.. in a context in which it was supported by other things, beliefs that you had. So therefore, naturally, what would be a law of nature, to what one person would call a law of nature, another person might not.

BAUBLYS: Mmm. It-it-it does seem to me, you see, that er whether something actually is a law-like regularity, is independant to whether anyone knows this, or indeed whether there are any people round at all. Um I think what I would want to say is that the er or one of the essential differences between er a universal law-like statement and a non-law-like statement er is that er a law-like statement um rules out certain conceivable er states of affairs as er physically impossible.

HANFLING: Could I just come in there, Ken, and put this question to Braithwaite.

HANFLING: (cont'd) Um I mean er Ken made the point that whether something is a law of nature is independant of what people say, or indeed whether there's any anyone is around; would you disagree with that?

BRAITHWAITE: Certainly, yes, certainly I disagree with that.

BAUBLYS: Disagree with it?

BRAITHWAITE: I do disagree with that, yes, yes. The-the thing that's, the thing that is independant of what a person says is with the generalisation, as you say, holds in both cases. Whether generalisation is to be called a law of nature or not.

BAUBLYS: Yes. So-so you'd want to say, for example, I mean if we go er er talk of given law, I say Boyle's Law, you'd want to say that um whether Boyle's Law *is, in fact, a law, is not something* that's independant of what people say? So if there weren't any people around ...(interrupted)

BRAITHWAITE: I should decline to answer the question, whether it is in fact a law. Because you see, this is an illegitimate question, I should say.

HANFLING: It's a bad question.

BRAITHWATE: Bad question, yes.

RAUBLYS: To put the-the question in terms of physical possibilities, you're really denying that there's any notion or physical possibility or physical impossibility, which is independant of what we might know the structure of our beliefs and so on. This is really what you're denying.

BRAITHWAITE: I mean, this is, there is no er physical necessity.

HANFLING: Could you say what is meant by it for you; by the phrase 'physical possibility.' Is it possible?

(All talking together)

BAUBLYS: Well of course I-I-I um agree that this actually is very difficult this is it's very difficult to give an account of the notion of physical possibility and physical impossibility independantly of saying things like um er a state of, a state of physically impossible er if the statement describing it is or ruled out by if it's logically and consistent with er a law of nature. Er and you might say that this isn't er enough.

BRAITHWAITE: No, I, you're-you're, I think you're just being circular; you're just using more words. And, you see, with regard to ruling out or exclude, after all er or an accidental generalisation, universal of fact, rules out .. in this way a lot of possibilities.

BAUBLYS: Indeed, yes. I, this is true, but on the other hand, if-if you consider er um a law-like statement. For example, consider the statement that nobody can travel faster than the speed of light, er I think that we all er have um a clear understanding what is

BAUBLYS: (cont'd) meant by saying that er the law excludes the possibility of a body travelling faster than the speed of light, with the notion of possibility actually is independant of the structure of our knowledge.

BRAITHWAITE: Er, oh yes, but, entirely, I quite agree with that it excludes that possibility by being merely the universal fact which it includes. That excludes the possibility itself without adding an extra law-like element

HANFLING: But if someone was to come along in addition and say one might want to do as an ordinary person, say not merely that a matter of fact this is always so, but it must be so, then you would want to say that this extra bit of 'must' isn't anything in nature; it's something that I, as it were, put into this.

BRAITHWAITE: If you're going to say 'must be so' er the only, I should say it was illegitimate to say 'must be so' unless you were going to er deduce it from some other er general law.

BRAITHWAITE: (cont'd) In which case the 'must' refers to the illogical, logic of that deduction.

HANFLING: Yes, well that brings us onto the next point I wanted to raise and this-this brings us on to the um to the question of how a person actually describes, comes to describe something as a law of nature and what the condition is under which he does so, and um here I would like to read er another bit that was re-printed in the book. This is top Page 194, and it says: "If the hypothesis that all men are mortal is regarded as supported solely by the direct evidence that men have died, then it will not be regarded as a law of nature. But if it's regarded as also being supported by being deduced from the higher level hypothesis that all animals are mortal, the evidence for this being also that horses have died, dogs have died, etc. then it will be accorded the honorific title of law of nature. Which will then indicate that there are other reasons for believing it than evidence of its instances alone."

HANFLING: (cont'd) Er, well, I'd like to ask there, fairly directly, that just whether it's really true; is it a necessary condition of calling something a law of nature that it must be er deducible from some higher level of hypothesis?

BAUBLYS: Yes. Er, I mean historically er I'm not sure that er this is er um a justifiable view. You see, I'm very tempted to say that as far as, for example, Boyle's Law was concerned, this was accepted by Boyle himself, and by others as a law, in spite of the fact that at that time er it-it was um established as a law; there was no theory, kinetic theory of gases from which it could be deduced. I would say historically, er the notion of er statements expressing law-like regularities is independant of the idea of them being part of a scientific deductive system.

BRAITHWAITE: Well, I've been trying to say this is due to have, not being a hypothesis or a perspective in that this, the possibility of making this distinction, I don't think, could have er occured in Boyle's time.

BRAITHWAITE: (cont'd) I mean, I think er the dif, the notions of the different sorts of necessity, I don't think were ever thought of really, until a century later. But with regard to my er my laying down the law in that way, like 'what is the distinction?' this of course, is stylistic. I mean I was writing a book and this is, er this is all prefaced by these as my ideas. What I was really doing er taking this er expressing this, not in the context of the book, I should wish to say a proposal which I make for a profitable distinction between laws of nature, er universals of law and universals of fact, would be that 'you shall call it ...' It would be that. And I don't really wish to say this is how people use er the words 'laws of nature' er but still it seems to be very ....

HANFLING: Well it isn't, it isn't, it wasn't wrong of of er Boyle and so on, to call their things laws and it isn't wrong of us to call, to say that they discovered laws, and it isn't wrong...

BRAITHWAITE: I never, I don't criti-sise other people for this. But there the point is how profitable is it, is the distinction made. This seems to be a profitable distinction to make.

BAUBLYS: You see, I still would insist though that it's quite independant, independantly of the historical point and, in order to -to go into that; you'd have to ask the historians of science. Even if you take the present day situation, I think scientists would be prepared to accept a certain statement as laws, even though they can't, as a matter of fact, be deduced from some overall theory. Actually there are great difficulties in finding such statements for various reasons at the present time, but I-I still think that um the notion of a statement expressing a law-like regularity isn't intrinsically tied up to it being part of a scientific system.

BRAITHWAITE: I-I-I think we only really disagree about the highest level ones. You say a lot of scientists would call those laws and according to my criterion they're not.

BRAITHWAITE: (cont'd) Well the other scientist I think, could be on the whole, slightly helpful that there will be further explanations valid.

HANFLING: Well what about, what about some lower level ones; I mean I don't know enough about er you know, to know my way around, but surely there must be some lower level laws that er that we do want to say are laws, although we haven't got um any higher level hypothesis. What about, for example, this-this case about water expands below 4° centigrade, isn't it? (interruption) I should want to say, I, as I'm not a scientist, but I should want to say that's a law, although I don't know any hypothesis ...

BAUBLYS: Even though, as a matter of fact, in this case there is one er as a matter of fact.

BRAITHWAITE: It's merely a matter of different sorts of methods of expressing it .., er if I should say it is a fact,

BRAITHWAITE: (cont'd) a fact about water resistance, we haven't yet got an explanation of it.

HANFLING: What about the element of necessity though, which I should want to put into it?

BRAITHWAITE: Well that yes, yes, yes, no, no.

BAUBLYS: Er there is er one feature of the account that you give in your book that I'd like to take up. This is um in your example of the simple, scientific reduction system where you have all animals are mortal as the highest level of hypothesis, and various particular animals. Now, on your accour um the statement 'all animals are mortal' actually is not a law because the only evidence for it are direct instances of particular animals being mortal. So therefore on your account, from a non-law, one can deduce laws and presumably er explain laws on the basis of non-laws. Now this, I find, very odd indeed. You're quite prepared to accept this consequence of your account?

BRAITHWAITE: But the-the deduction is always between the generalisations - doesn't matter whether they're laws or not. Er I'm saying is the deduction.

BAUBLYS: Yes, oh yes, this is true, yes

BRAITHWAITE: That's a deductive system. I mean it's perfectly true I call my principles, will call things laws that stand lower in the deduction and the upper things will not be called them.

BAUBLYS: But, but you're quite prepared to accept that on your views on non-laws, one can deduce laws...

BRAITHWAITE: Well, no, no, no, no. What I call laws, from what you call non-laws, I'm perfectly prepared to, I-I can deduce other generalisations which I am prepared to call laws.

HANFLING: What, what is actually wrong with this, Ken; I mean is it a kind of logical point that you-you think there's more in the-in the conclusion than there is in the premises, is it that kind of thing?

BAUBLYS: Ummm, well it's something like that; it's not quite like that. I-I think er what I have in mind here, is um that there's the notion of explanation that we have um is such that er in the, just in the same way as we want to say that particular instances can be explained if they're deduced from laws, and not just deduced from, er you know, incidental generalisations. Similarly in deducing laws, you want them to be deduced from other laws, and not just from .. otherwise ... This is really the point I have in mind.

HANFLING: With-with the link with explanation, yes.

BAUBLYS:. That's right, that's the reason why I want to say it's very odd to say that one can deduce er laws from non-laws .....

HANFLING: Yes, I wonder if I could bring in at this stage er another-another passage which um brings out rather well the er the connection

HANFLING: (cont'd) between er somethink being a law and being able to explain something, and this is on-on page 195 of The Reader, and it says: "Generally speaking a true scientific hypothesis will be regarded as a law of nature if it has an explanatory function with regard to lower level hypothesis or its instances; vice-versa to the extent that a scientific hypothesis provides an explanation to that extent will there will be an inclination to endow it with the honourable status ofnatural law?" Um, and this brings out rather well, doesn't it, how for you the two er aspects of law are interlinked?

BRAITHWAITE: Oh yes, yes.

HANFLING: But it's explanatory insofar as it's as it's deducible on a higher level, yes.

BAUBLYS:

Yes, I wo, I wouldn't disagree from that quote very much. Er I would just want to er say that um the relation between something being, from my point

BAUBLYS: (cont'd) of view, something being a law and being part of a deductive system is that, if a statement is part of a deductive system, this provides very good reasons for supposing that it is a law-like regularity. In other words the connection between being a law, being part of a deductive system, is a relation of or of just justification; there are good grounds for supposing this or rather than making the notion of a law intrinsically dependant on being part of a deductive system in the way that you want to do.

BRAITHWAITE: Yes. I don't think we or our disagreements come to anything more really than that you would like to call, you would call the top of the deductive system at any stage more probably. Whereas my principle my or criterion does exclude the top one from being a law, except, unless to the extent that you are assuming that it will be including it or hope that it can be included on a wider, in a wider system.

HANFLING:

One thing that worries me and er I think this would go for-for both of your accounts, is that, we have this kind of hierachical account with er laws explained by other laws and so on - we go up and up and up - but er it seems that we're always going to have something at the top, right at the top that are not going to be themselves explained and one might think, well if they aren't explained, then this infects the explanation all the way down the line. So we haven't really got explanation anyway. Are either of you worried about this?

BRAITHWAITE: Well, I'm sorry, this is this is the classical objection, anti-scientific objection, that science does not roduce ultimate explanations. Never does produce ultimate explanations The answer to that is that it's the nature of science not to be able to produce ultimate explanations. And all we can ask is a further question.

BAUBLYS: Yes, yes. I would-would absolutely agree with that, and and just reiterate the point um by-by saying that if you consider the logical scientific explanation, it is quite obvious that at any particular point however advanced your science is, you'll always have a situation where certain of your premises are un-explained; they are the premises that serve to provide the explanation. This is er really just a logical point about the nature of scientific explanation. You'll always have ....

HANFLING: This is something that comes whether we take thismodel or not, in fact, on any conception of science.

BAUBLYS: I think so, yes indeed.

HANGLING: I think on that er note of agreement we'll have to end the programme. Thank you very much R.B. Braithwaite and Kenneth Baublys.