

amount of pigment. I agree with the passage that you read from the "Development of the Human Eye" by Dr. Ida Mann, page 227 - "The development of pigment in the stroma of the iris occurs after birth and to a very variable extent. In deeply pigmented eyes an extensive deposit takes place in the superficial layer so that the details of structure may be entirely hidden." I would agree that the superficial layer is the anterior limiting layer to which Mr. Wolff refers, that it is immediately under the cornea, and it is the front part of the stroma. I should say that I agree with the following statement of Dr. Mann - "It must be realised that the so-called ~~sculpt~~ sculpturing of the iris seen in life in blue and grey eyes is due to the visibility of the vessel walls and, occasionally under magnification, of the blood column itself, the intervening stroma being quite transparent." I think the following passage is correct - "In brown eyes the stroma is no longer transparent, and the vessels cannot be seen except those which may be in relief on the surface," I do not know that I am qualified to express an opinion on the following passage - "In ^{light} blue eyes, during life with good illumination and magnification (of 24 or more) it is often possible actually to make out two or sometimes three layers of vessels which may cross at acute right angles, the deeper ones running to the pupillary margin, the superficial ones anastomosing at the lesser circle." I see figure 34 on page 23 of Wolff's. I should think that would be a blue eye with a deposit of pigment in one area. As to it being quite a common thing to see blue eyes with brown pigment areas in them, there may be spots of pigment. Chromatophores are pigment cells. As I said before, I have not any accurate knowledge, but so far as I know I agree with the following passage from Koby's Slit Lamp Microscopy of the Living Eye - "The amount of stroma pigment is very variable and is largely responsible

for the multiplicity of structural appearances. The luminous beam of the light penetrates much more deeply into the blue iris than into the brown. As for grey irides, one can often verify the assertion of the old anatomists that their tissue is more compact than that of the blue. The blue iris presents the appearance of a very delicate almost airy tissue. The fibres and trabeculae look like transparent wool. The deeply pigmented area has on the contrary a smoother surface, a more compact tissue suggesting the appearance of tinder. Even in an iris which appears quite blue to the naked eye it is almost always possible to make out under the microscope groups of chromatophores producing yellow spots in the superficial layers of the stroma. These cells are never seen otherwise than in groups." I would agree that the proper way of determining the colour of the iris would have been to have had a transverse section of the iris, from the ~~the~~ before backwards. That was not done. The iris was mounted flat. It was mounted by Dr. Wright-Smith's technician. The report I read is Dr. Wright-Smith's and my joint report. At the time Dr. Wright-Smith and I wrote it I had not looked at the iris through a slit lamp. I do not think Dr. Wright-Smith had. I looked at it with the naked eye and with the microscope. We certainly saw the retinal pigment layer during that examination. That is not what led me to say that there was a large amount of pigment at different levels. Besides the retinal pigment layer we saw other portions of pigment, which, under the microscope, appeared to be at different levels. In this iris I did not see pigmentation spread evenly throughout the upper surface of the iris. I do not know that in order to have a brown eye you have to have the pigment spread evenly over the front portion of the surface, of the anterior limiting layer; but you have to have a considerable amount, a large amount. I did not see a dense spreading of pigment in the upper surface of this iris. We only saw particles of pigment at

different levels. I do not know that the retinal layer of this iris had been torn in parts; it had in the other one. I agree that when the specimen was placed under the microscope that in places you could see the light coming up from the sub-stage of the microscope, and that when the slit lamp was used the light could be seen coming through the stroma. As to whether if the retinal pigment layer had not been ruptured in some way you could not see the light coming through in that fashion on that flat mounting, I could not say as to that. In Dr. O'Day's room I examined this specimen under a slit lamp and Dr. O'Day pointed out to me that the stroma was more or less translucent. I do not remember Dr. O'Day expressing the opinion that it was a light coloured eye, not a brown one. He said that he thought there was not very much pigment in the stroma. The impression he gave me was that he thought there was certainly not enough pigment in the stroma to cause it to be a brown eye. I do not know that he indicated to me at the time he and I jointly examined this eye that he was not of the opinion there was a very large amount of pigment at different levels through the stroma. I do not remember him saying anything about it being at different levels, but he gave me the impression that he did not think there was a great quantity of pigment in the stroma. Unless there was a great quantity of pigment in the stroma, it would not be a brown eye. As to saying that there was ~~some~~ scorching of the body from the pubis to the chin, I think we said above the breasts. I do not remember whether it was to the chin or above the breasts. My report says that the front of the body was scorched to above both breasts, and the chin was scorched. I mean there that the chin was scorched. The scorching from the pubis to above both breasts was continuous. Then there was an area above both breasts which was not scorched and then the chin was scorched, and both cheeks were scorched. There was the discoloration

and a certain amount of hardening of the skin to indicate scorching. There was no deep destruction of the skin, it was only superficial. I should say that only the superficial layer of the skin was destroyed. I say that the skin was hard and discolored. As to there being anything peculiar about the discoloration which makes it ascribable to fire as an agent rather than to any post mortem changes, it was a dark brownish discoloration. I have never previously seen a body kept in formalin for ten years. I have no knowledge of what discoloration would follow as the result of that. I found that the breast tissue was firm and pale. That was inside, under the skin. I see a number of breasts illustrated on the book produced, Forensic Medicine by Sydney Smith, at page 302. All except the first one are described as pendulous breasts. I do suggest that if the breasts were anything like that in life there was sufficient action of heat to cause the breasts to assume the appearance that they had on this body; I think the amount of heat would be sufficient to cause them to appear like they were. I would not say they would be very pendulous. I would not say they were drooping but they would be flat during life. As to agreeing that the appearances I saw in that body showed that they were not drooping breasts in life, that depends what you mean by drooping. They would not be soft hanging breasts; but they would be flat, and possibly when she was upright they would be slightly pendulous. On this body the breasts were firm and pointed, almost like pyramids. As to there being no interference by fire with the breast tissue, the skin was all scorched. I think that the skin is part of the breast tissue. As to there being any distinction between the skin and the breast tissue, they are all part of the breasts. I agree that in my report I drew a distinction between the skin over the breasts and the breast tissue. That is a correct

distinction. So far as I could see there was no action by fire upon the breast tissue. As far as the breast tissue was concerned, its shape or its size had not been affected by the fire. As to whether if there had been any action by fire affecting the shape of the breasts, it was action on the skin, it would be action on the skin, and the heat might have spread to the tissues but there was no indication of it. Any heat applied to the breast tissue would not necessarily leave any indication. I agree that under those circumstances we are in the position of not being able to say whether or not heat did extend to the breast tissue. I should say that the heat which was applied to the surface of the breasts might easily have altered their shape without leaving any indication on the breast tissue. As to ever having seen that happen before, I do not know that I have ever especially examined a breast which has been exposed to fire. As to whether what I have just said amounts to no more than a guess, it is an opinion. I agree that opinions do vary between what is almost equivalent to a statement of fact and a statement of what is mere speculation. If you put it to me that what I said about the breasts having adopted the shape they had before my post mortem is, having regard to the fact that I have never carried out any experiments in the matter, only a speculation, I say that the opinion I expressed to you is due to the fact that the skin had been scorched and I think it is a reasonable opinion to assume that the shape of the breasts would have been altered by the heat to which they had been exposed. I agree that the whole basis of a scientific opinion is that the person who is giving it goes upon certain ^{formulated} demonstrable principles in relation to a matter where, if possible, he can demonstrate the validity of the facts upon which he relies. I have not conducted any experiment to see what is the effect of heat upon breasts which are exposed to heat. I do not know of any one who has conducted experiments upon breasts of

dead people. I cannot think of any literature on the matter at the present moment. As to whether I had no literature in mind when I expressed the opinion I did to you, the burning of a body will cause a certain amount of contraction. I do suggest that if a dead body is burnt that contraction will be caused; ^{it} ~~the~~ causes what is known as heat stiffening, and accompanying that is a certain amount of contraction. That condition is quite different from rigor mortis. I do not think it has anything to do with rigor mortis. I agree that Sydney Smith ~~is~~ an authority of whom we may take notice in these matters. As to Sydney Smith at page 20 putting "Heat stiffening" under the heading of "Conditions simulating rigor mortis", it simulates rigor mortis. As to whether if a person is alive and her breast is burnt that there is usually destruction of skin and tissue, it depends on the extent of the burns. As to whether there will not be any alteration of shape in life until scar tissue forms, after a burn, yes. It is correct that if there was no scar tissue there would be no alteration in shape from burn. If there is no scar tissue there is no contraction. As to whether if a female got her breasts scorched in life there would not be any alteration to the shape of her breasts at the time of the burning, that would depend on the extent of the burn and the depth of the burn. As to there being no alteration in the shape of the breasts in life if she only got her breasts scorched, there would be only blisters of the skin. There would not be any alteration of the shape if the scorching was only superficial. I agree that scorching is the application of heat superficially, not to a degree to cause destruction of the skin by burning. If the breasts of a female are scorched in life they will not alter shape, not if the tissue was only injured superficially. As to whether scorching ~~involves~~ involves any injury to the tissue, there is some injury to the tissue, superficially. If the only thing that happened

to the breast was that it was scorched I do not think there would be any alteration in the contour of the breast. There was no sign of blistering of the ~~breast~~ skin on the breasts of this body. You do not get the same amount of blistering if the burning is after death. There was no marked destruction of the surface of the breasts of this body. The skin was brown and scorched, but there was no marked destruction of it. Asked if I will not agree with you that there is no scientific justification for saying what had happened was sufficient to cause an alteration of the shape of the breasts, I say No, I cannot say that. It is only an opinion expressed. You might say it is a conjecture. When we opened the nose there was cotton wool actually packed in. There was wool up in the nose. I could not say when it was put in. As to whether it had been impregnated with formalin, it was more or less dry. It was slightly discoloured, not much. There was more in one nostril than in the other. There was a fair amount in one nostril; I think I mentioned which nostril it was. The photograph produced (Exhibit 00) is a fairly good photograph of the face of the corpse. I do not agree that an examination of the nose in that photograph shows that there has been an injury to the nose which has distorted the shape of the nose. There was no displacement that we could see. As to agreeing that when looking at the photograph it looks as if there has been an injury to the nose which has altered the shape of the nose, there is something there; I could not say what it was. I pointed to what appears to be a bump at the bridge of the nose. As to the bridge of the nose being fractured, there was a fracture running down this bone here (indicating). The bone which forms part of the bridge of the nose was fractured. As to whether I would expect under those circumstances some alteration of the shape of the nose resulting from that fracture, I could not see any, the

nose was perfectly straight. As to agreeing that the photograph indicates the nose has a bump there, I will not agree that it represents what I saw. As to agreeing that the photograph indicates that there was a bump in the corpse's nose, it looks like it. I saw nothing in the post mortem examination which could be ascribed as the basis for the appearance in that photograph. As to offering any explanation of that, I should think there was a slight swelling there due to decomposition which has since disappeared. Then nostrils were not in the same condition as they were in life; I think they had been distorted by the cotton wool. The cotton wool was in the nostrils, and some had been pushed higher up. As to putting my finger on what is the deformity that I see in the nose in Exhibit OO, just here (indicated) it looks as if there is a very slight swelling. Looking at the photograph produced (Exhibit N) the nostril I indicate appears to be pushed out. I should say that it had been pushed out to take on the appearance of an oval nostril rather than a slit nostril. I do not know that Professor Sunderland was asked about these nostrils. I have had only a very slight discussion with Prof. Sunderland about this matter. I read his report. As to not agreeing with him when he says the hair could be parted on only one side, that I say it could be parted on either side or in the middle, I parted it with a comb, and I could part it in the middle and there was a parting on either side where it could be parted. As to Professor Sunderland saying there was nothing to indicate that it had ever been parted on the left, but as far as I could see there was nothing to stop it from having been parted on the left, in the centre, or on the right, it looked to me as if it had been parted in the middle. I agree that looking at that hair I could not say whether in life she wore it parted on the right, on the left, or in the centre, or whether there was a parting at all. I would not say that there was any

indication in the photograph produced (Exhibit QQ) of the profile of the corpse of any injury to the nose. As to the injury to the nasal bones, if any, shown in the X-Ray of the skull produced, the nasal bones do not seem to me to come out very clearly here. There is no indication in the X-Ray film of the injury that we found; but I do not know whether that is the right side or the left side. As to whether I found any injury to the left parietal bone, there might have been a fracture there. As to the squamous portion of the temporal bone, most of that was missing. I know Peterson ^{and} Haines on Legal Medicine and Toxicology. I agree with the following statement which you read from page 139 of Volume 1 of the 2nd Edition of Peterson, Haines & Webster in the article on age where it states "The recent investigations of Watzbalz on the determination of age from the condition of the upper humeral epiphyses are of interest. Between the 30th and the 35th year in man and after the 28th year in Woman the medullary cavity extends to the end of the surgical neck. The medullary cavity in the shaft of the humerus is a reliable indication of age." The statement "Between the 30th and 35th year in man, and after the 28th year in woman the medullary cavity extends to the end of the surgical neck" is a fair statement. If Linda Agostini was 29 and that is the body of Linda Agostini the medullary cavity should have extended to the end of the surgical neck. As to the portion of my statement which reads "The marrow cavity in the upper portion of the right arm bone reached half way between the surgical neck and the epiphyseal line" indicating that she is under 28, I say no, if anything, it would indicate she was over 28. That portion of my statement reads "The marrow cavity in the upper portion of the right arm bone reached half way between the surgical neck and the epiphyseal line"; this extended slightly further. The epiphyseal line is above the surgical neck. It went slightly further than the surgical neck. I will agree

that, as a general rule unless in a young person it is not easy to fix the age with any degree of accuracy. That statement appears in my book. When I made that statement I was writing on the ossification of the bones. I do not regard this body which I have examined as an exception from the general rule. I will agree that any opinion as to age can only be approximate within a year or two. I agree with the table that is given by Prof. Sydney Smith at page 71 of his work. I agree with the following statement - "That the basi-occipital ~~suture~~ fuses with the basi sphenoid at about 18 to 20, not 25 as commonly stated." It fuses earlier than 25 years. As to agreeing with the statement of Sydney Smith which he makes in connection with ossification in general - "It should be remembered that it is delayed when certain of the internal secretions are absent", I think it is very likely. I could not say if it may be accelerated if there is an overabundance of some of the internal secretions. I agree with the statement by Prof. Sydney Smith at page 75 where he says "From 16 to 25 years the union of epiphyses with their shafts, especially in the bones of the elbow, wrists, and fingers is the main guide. The eruption of the third molars, which usually occurs about 18, is a point of secondary importance. After the age of 25 we must be guided by general changes in development, and general appearance." If you say that after 20 or 21 the position is that the most one can do is to approximate within two or three years when giving an age from the examination of a body, I say after 25. If you suggest after 21, I say no, I think after 25 it applies, not after 21. As to what I mean by young people in my text book where I say that "As a general rule, unless in a young person, it is not easy to fix the age with any great degree of accuracy", and whether I am not referring to young people in whom the epiphyses are still in process of formation, by young people I mean anybody under 30. Asked to look at the passage which reads ~~g~~
"The cornua of the ~~max~~ hyoid bone become ossified to the body about middle life - 40/50; A little later the sutures of

the skull become more or less indistinct. In older people still, the alveolar process of the jaw begins to show signs of atrophy (there may be marked atrophy of the lower jaw in quite young persons, owing to the practice of having all the teeth extracted, especially in women^u; the neck of the femur in old persons becomes more horizontal and somewhat shorter. As a general rule, unless in a young person, it is not easy to fix the age with any great degree of accuracy", and asked if I mean to say that a young person there is a person under 30, I say yes, I would call anybody under 30 young. For the purpose of a text book on pathology, I consider ~~a~~young person is a person under 30. I have read Glaister's Text Book on the matter. I could not say definitely what he says about ossification and age from memory, but there is a copy here if you would like to have it. I do not remember exactly what he says about it.

(Page 85~~k~~ follows).

Richard A. Mollison

KEVIN JOHN O'DAY on his oath saith -

TO MR. BARRY: My full name is Kevin John O'Day, and I am a legally qualified medical practitioner carrying on my practice at Collins Street, Melbourne. I specialise in the treatment of diseases of the eye. As to my medical qualifications or degrees, I have the Doctor of Medicine and the Bachelor of Surgery of the University of Melbourne. I also hold the Diploma of Ophthalmic Medicine and Surgery which is granted by the Royal College of Physicians of London and the Royal College of Surgeons. I am also a Fellow of the Royal Australian College of Surgeons in Ophthalmology. I took up the study of eye work in 1929. I spent four years abroad. During that time I was Ophthalmic House Surgeon to the Royal Infirmary at Sheffield, to the Birmingham Eye Hospital, to the Kent County Ophthalmic and ^{AV}Oral Hospital, and to the British Ophthalmic Hospital of St. John of Jerusalem. I also held the position of out-patient officer at the Royal London Ophthalmic Hospital; that is also known as Moorfields. That is the leading eye Hospital in London. ^{AFTER} On my return to Australia I was in receipt of a grant from the General Health and Medical Research Council to enable me to pursue researches into certain structures of the eye. I held that grant for some three years and pursued those researches. I pursued researches in connection with the eye at the Melbourne University and also at St. Vincent's Hospital. I am Ophthalmic Surgeon to St Vincent's Hospital. I am aware that in this case the question has arisen of the colour of the iris in life of the right eye of the body which has until recently been at the Morgue. Wolff's Anatomy of the Eye and Orbit is an authoritative book. The following statement which you read from page 54 of the Second Edition of that book is correct - "The structure of the iris is said to consist from before backwards of the following five layers; one, the anterior endothelium, secondly, the anterior limiting border layer; thirdly, the stroma, fourth, the posterior membrane; and fifth, the

posterior epithelium." The posterior epithelium is often referred to as the retinal pigment layer. The passage which you read from page 55 "The anterior limiting layer is really a condensation of the anterior part of the stroma. It consists of a dense matting produced by Anastomosing and intertwining processes of connective tissue and pigment cells. On the anterior limiting layer depends the definite colour of the iris" is a currently accepted opinion. The statement "In the blue iris the anterior limiting layer is thin and has only a few pigment cells. In the brown iris it is thick and densely pigmented." is a correct statement. There is something about the plate on page 53 of the volume to which I desire to direct His Worship's attention. There is the fact that although the surface of the iris is unpigmented there is a dense black spot of pigment visible in the picture. That would be a blue eye in life.

TO THE CORONER: That black spot of pigment is labelled "Mole".

TO MR. BARRY: It is quite a common thing to find spots of pigment in blue eyes. It is very often, for the inexpert, a source of danger, because people who are not used to ^{DEALING WITH THESE MATTERS} ~~doing things~~, if a patient complains of having a sore eye, will ~~often~~ sometimes try to remove one of those spots thinking it is a foreign body. They stand out very vividly, and it is very difficult to tell the position, ^{whether they are on the cornea or the iris} As a matter of fact, I have two such spots in my own eyes, which I think are blue. I have blue eyes, but there are actually brown patches of pigment in my eyes. The volume "Development of the Human Eye" by Dr. Ida Mann is regarded as authoritative. She is the greatest English authority on the embryology of the eye. The passage at page 227 of that volume which you read - "The development of pigment in the stroma of the iris occurs after birth and to a very variable extent. In deeply pigmented eyes an extension deposit takes place in the superficial layer, so that the details of structure may be entirely hidden. It must be realised that the so-called "Sculpturing" of the iris seen in life in blue and grey eyes is due to the visibility of the vessel walls and, occasionally under

ex magnification, of the blood ^{COLUMN} ~~column~~ itself the intervening stroma being quite transparent. In brown eyes the stroma is no longer transparent and the vessels cannot be seen, except those which may be in relief on the surface. In light blue eyes during life, with good illumination and magnification (of 24 or more), it is often possible actually to make out two or sometimes three layers of vessels which may cross at acute ~~right~~ angles, the deeper ones running to the pupillary margin, the superficial ones anastomosing at the lesser circle" is a correct statement. The statement which appears in Hoby's Slit Lamp Microscopy of the Living Eye at page 184 - "The blue iris presents the appearance of very delicate almost airy tissue. The fibres and trabeculae look like transparent wool. The deeply pigmented area has on the contrary a smoother surface, and a more compact tissue suggesting the appearance of tinder. Even in an iris which appears quite blue to the naked eye it is almost always possible to make out under the microscope groups of chromatophores producing yellow spots in the superficial layers of the stroma. These cells are never seen otherwise than in groups" - is a correct statement. I have certain slides here which it is desirable to show to His Worship.

(At this stage the Court adjourned to the jury room.)

This is an actual thin section of an eye which was removed at operation some years ago and of which I made a thin section. This section is about ¹²~~12000~~/₁₉₀₀ths of a mm. thick. It is a transverse section. Supposing you were standing on top of the eye and looking down, it is the same effect as seeing the ground floor plan of a house. This is the front of the eye, and this is the back of it. (Indicated) The section has been stained to show up certain structures; this is not the actual colour of it. This structure here (indicated) is the cornea which during life is clear and perfectly transparent. Behind the cornea you have a space called the anterior chamber which is full of clear fluid, a dilute saline

[Handwritten signature]

solution, and is almost perfectly transparent. Behind that you have the iris, which is the circular curtain, rather like the diaphragm of a camera. It serves the same purpose and has the same function. It regulates the amount of light entering the eye. It is really in the form of a thick ring, so that if we cut a section across the centre of the ring it will be seen that we will have a piece of the iris on each side, and the pupil in the middle. The iris gives the colour of the eye. The pupil is black. Behind the pupil you have the lens of the eye and the inner darkchamber. In order to explain the colour of the eye, I should just like to explain why the pupil is black. If a ray of light enters an eye it comes out of the eye again; it is reflected from the back of the eye and returns along the same path. If we wish to see anything it is necessary that we must have light reflected from that object into our own eye. Light must come off it. Normally, that is not possible when we observe an eye. Any light that enters the eye comes back along the same path, so that it will not on any occasion strike our own eye. A piece of cloth is black because all the light that reaches that piece of cloth is absorbed, and none of it is reflected to the eye, and we do not see it. We just get a black sensation. That is exactly what happens with the pupil. None of the light which enters the pupil is ever reflected back into our own eyes, with one exception, that is in the case of an Albino. An Albino is a person in whom the pigment layers of the eye, or pigment anywhere, is not developed. If you look at the iris here you can see that at the back of it there is a thin dark line. That is the retinal pigment epithelium. In the Albino that is not present and light entering the eye returns not only through the pupil but also goes out through the iris. In the case of a normal eye there is just this aperture which is transparent. The rest of the iris is opaque because of this thickly coloured pigment layer at the back of the iris. In an Albino's eye, for that reason, the colour of the iris is

a dirty grey. It is just like a white curtain hung up in front of a light, we see the light transmitted from the back of it. The inside of the eye is not black but actually red, and when we look at it with an instrument called an ophthalmoscope we can see it quite easily. An ophthalmoscope is a mirror with a hole in it, and it enables us to place our eye in a favourable position to receive the light coming from the back of the eye. The stroma is anterior to the pigmented retinal layer. This is the pigment layer here (indicated) at the back of the iris, and it is very thick. The pigment in it is so thick that it will not transmit any light at all. As I said before, when I cut the section I made it about a ^{12/1000}~~12,000ths~~ of a mm. thick, and even at that thickness it is densely coloured and impervious to light. Sitting on the front of that you have the stroma of the iris, which is about 1 mm. thick. It is very delicate, and when it is not pigmented it is an almost perfectly transparent tissue. In the case of the Albino it does not hold up the light to any great extent and it looks like a transparent veil and the colour then is a dirty grey. If we take the case in which the pigment layer is developed, that normally occurs at ^{BIRTH}~~first~~. The newborn never have a well developed pigment layer stroma in front of the iris - have no pigment in the layer at all. If we look at the baby's eye, we see a black pupil and a very deep blue iris. The blue in the baby's iris is due, not to any actual blue colouration, any blue pigment, but to a curious optical phenomenon. That is, light coming from here "(indicated) strikes on the surface of the iris, it penetrates to the retinal pigment epithelium - it goes through the stroma - and it is reflected. Obviously, when light strikes a mirror it comes back again in a straight line. If light strikes a surface, such as a white wall, the surface is not perfectly smooth, and the light is scattered in all directions. This brown pigment is extremely irregular. Some of the light is absorbed, and some is reflected back towards the observer, and some is diffused in all directions.

The light which is actually diffused mostly is the blue part of the light - the blue colour. The scattered light is again reflected back to the observer's eye, and it is this scattering of the light which gives the iris its blue colour. Actually the stroma of the iris in the baby is exactly the same as it is in the Albino. But that is the reason for the difference in colour, the presence of the pigmented layer reflecting back the light. There is a microscope that nowadays is used in medical practice quite a lot. It is known as the Slit lamp. It is a combination of a binocular ~~and a~~ microscope, ^{and a bright light} and it can give a magnification up to 40 diameters.

With a bright pencil of light, which can be thrown in at an angle the observer illuminates the surface of the iris very intensely with the light and looks at it with a powerful microscope. Under those conditions you see what Dr. Mann describes in her book in the transparent iris when there is no pigment present. It is quite easy to see the column of blood in the blood vessels. We do not see the walls because they are transparent. We can see right through ~~to~~ the surface to the posterior epithelium. There is that one class of individual which never throughout life develops any pigment - the other class will develop pigment in this ~~class~~ part of the iris in varying degrees. That is in the stroma itself. That is quite separate ^{from} ~~to~~ the pigment of the retinal pigment epithelium, and the blue eye always has very dense retinal pigment epithelium. That is the first pigment it has, we can be quite sure of that. There may be a certain amount of pigment laid down in little particles in the stroma itself. The pigment is a brown substance called melanin, and it exists in the body of certain cells. Those cells are known as chromatophores. If we examine the stroma under the microscope we can make out individual chroma^{to}phores. If those chroma^{to}phores are grouped together in clumps we may be able to see them actually with the naked eye. In addition to those chromatophores developing pigment everywhere throughout the stroma, there may also be an additional development

of chromatophores on the front surface of the iris, particularly in great numbers near the pupil edge. There is a distinction between those two groups of chromatophores.

(At this stage a request was made that Dr. Mollison, Dr. Wright-Smith and Prof. Sunderland should hear the evidence.)

I was describing the distribution of the chromatophores in the stroma of the iris. Even in a densely blue eye there may be myriads of these chromatophores scattered around in the stroma itself, and yet they are not visible to the naked eye.

They will influence the colour of the ~~light of~~ the iris to a certain extent; it does tend to change the colour of the eye from blue to grey owing to interference with the dispersion of light. In addition to those, you have those denser clumps of cells congregated on the anterior surface of the iris, and it is those which gives the iris its characteristic brown colour. If one looks now at a brown iris with a slit lamp one can see quite easily that the blue iris is obscured. The columns of blood have disappeared, and one cannot under any circumstances see the retinal pigment epithelium. Occasionally

in blue eyes one sees isolated spots of pigment sitting on the front of the iris. Those are sometimes referred to as "moles" and the picture is so vivid that ^{when} one sees them they seem to be on the front of the iris. I think that just about explains all there is to be seen about the pigment. I have slides of blue eyes and of brown eyes. These happen to be slides which I made, not for the purpose of this inquest but just in the course of clinical investigations. The slide I am projecting is that of a brown eyed girl. You can see that she has very deep brown eyes. That is due to a deep ^{ag} ~~con~~gregation of pigment on the anterior surface of the iris stroma. The slide I now project has again been taken for the ~~pink~~ clinical condition you see; but I was very much impressed at the time at the excellence of the colour picture. You would say, looking at that woman, that she has blue eyes. At the same time, you can see little brown spots of pigment on the

anterior surface of the iris, proving that although the iris is blue pigment is present in quite a large amount. This slide is again one which I selected at random. It shows a blue eye, and again you see the spots of pigment which the artist has represented faithfully. He was not intending there to show the structure of the iris, he was just making a colour picture of quite a different condition. There, on the other hand, is a brown eye with deep layers of pigment, deep deposits of pigment on the stroma.

(At this stage the hearing was resumed in the Court.)

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Last Wednesday, April 19th I was invited to go to the Royal Melbourne Hospital to inspect what I believed to be the right eye removed from the body of the Pyjama girl. Dr. Mollison, Dr. Wright Smith and Mr. Monahan were present. For the purpose of examining the eye to determine what colour it had been in life, as to what in my view would be the correct technique, once the eye had been removed from the body, I say the cornea should have been removed - that can quite easily be done by slicing it off with a razor - and the eye-ball should have been ~~was~~ immersed in a saline solution to reproduce, as near as possible the conditions obtaining throughout life; the eye should have then been examined with a condensing lens, a magnifying glass, and then with the slit lamp. When I saw the iris, it had been removed from the eye and was mounted on a slide, mounted flat. As to whether I observed anything about the retinal pigment layer as a result of my examination of the eye on Wednesday, it had become detached in places - it is a layer which is easily detached and it had come off in several places. One could then look through those gaps, actually from either the front or the back of the slide, and see light shining fairly clearly through the interstices where the epithelium had come away. That was an indication that the stroma was translucent. As to whether the condition of the iris was then such that I did not care then to form a concluded opinion, Dr. Wright-Smith asked me whether I would mind waiting for a few days because of the fragility of the specimen and to allow the balsam to dry. The iris was then mounted flat on the slide and brought to my rooms by Dr. Mollison. I there examined it, with the aid of the most modern apparatus ^{FOR} of examining such a subject. I carried out that examination with a slit lamp. Before subjecting it to the examination by the slit lamp, I first of all examined it with an ordinary microscope and one was able to focus through the different layers of the stroma of the iris and one could see

through those holes which I have mentioned before, and, suspended in the stroma, were quite a number of tiny particles which may or may not have been pigment. There was no dense layer there. One could see quite easily between all these little particles and the light shone quite brightly through the holes in the pigment epithelium. That is just the examination with the ordinary microscope, in which one shines a light through the specimen from underneath and looks at the shadows through a microscope. I would not agree, at that stage, with the opinion that there was a very large amount of pigment at different levels through the specimen, suggesting the eye was brown. I then continued my examination further. I then suspended the slide in a slit lamp, in the stand, in the place where the patient's eye is usually placed, and examined the specimen with the slit lamp up to a magnification of 40 diameters. When the light was thrown on the specimen from the side, I saw the front aspect of the iris. It stood out quite clearly and it was actually a dirty white colour, rather deeper than the walls of this room. In a few places there were isolated dense aggregations of pigment, one of them was pretty similar to the picture in Wolff's book. There were not very many of these, two or three large ones, and they were scattered around the iris. ~~Out~~ towards the outer edge of the iris, towards the white of the eye, was ~~another~~ ^{another} localised aggregation. There was no evidence of any dense aggregation of superficial pigment. This was noticed also near the margin of the pupil, because it is in this place particularly that the pigment is collected in a brown eye. There was no dense collection of pigment near the margin of the pupil. Dr. Mollison was present when I made this examination. Asked if, as a result of that examination, I arrived at any conclusion as to whether the iris was that of a brown eye or an eye of some other colour, I would say it was my conclusion that it was the iris of a light coloured eye,

more likely to have been blue or grey than brown. I reject the possibility of its having been a brown eye in life.

TO MR. READ: I first became interested in the question of this eye last Wednesday. As to whether I had ever heard of it before then, as a matter of fact, I had seen the references in the newspapers, but I had not ^{at} any time ~~to~~ read the account of the trial at all thoroughly. The question concerning the disputed colour of the eye was discussed with me by a medical friend of mine, Dr. Charles Byrne of Sunshine; that was on Tuesday evening. Prior to Tuesday evening, when I had a discussion with Dr. Byrne, no one else had discussed the question concerning the eye of the deceased with me. Asked when was the first time I knew there was likely to be any dispute about the colour of the eye in the deceased, I say that is the first time that I have any very definite recollection. I remember from a hasty reading of the paper that the question was brought up as to whether it ~~was~~ was a brown or a blue eye. I remember that but I do not remember to whom that referred. My brother is Dr. Gerald O'Day. I do not see him ~~very~~ frequently. The first person who told me about ⁿ any discussion concerning this eye was Dr. Charles Byrne of Sunshine on Tuesday night last. Until that time, I had no discussion whatever with anyone about the disputed colour of the eye. I had no such discussion with anyone. I had not had any discussion with my brother about it. I had not read in the paper about the dispute concerning the eye. The first time I heard about it was when my doctor friend from Sunshine discussed it with me. As to whether he pointed it out to me or whether I pointed it out to him, I do not quite know what you mean. As to how the discussion came up, Dr. Byrne rang me up and told me he had had a discussion with Mr. Monahan, whom he had met at a police Court that day, and he had told him about the discussion concerning the colour of the eye. I gathered from the conversation that he was

told there had been no expert evidence concerning the subject of the colour of the eye given up to that stage. He suggested to Mr. Monahan that I should be communicated with, and asked if I would examine the eye and give an opinion concerning the colour of the eye; that was on Tuesday night. At 8 o'clock, the following morning, Mr. Monahan rang me at home and asked me whether I was willing to appear and give evidence. I am afraid I cannot give in detail the conversation with Mr. Monahan, but the substance of it is that at approximately 8 o'clock in the morning Mr. Monahan rang me at my house and asked me would I be willing to examine the eye and give evidence. I said I would be willing to do that. At a quarter past 4 that afternoon when I had just concluded my work at the Medical Eye Service at Exhibition Street, Mr. Monahan rang me and said he had arranged for me to meet Dr. Mollison and Dr. Wright-Smith and examine the eye as it then was. Shortly after, he called for me and took me to the Walter Eliza Hall, and I met Dr. Mollison and Dr. Wright-Smith at the Melbourne Hospital. I agree, at that stage when I went to the Melbourne Hospital I knew Mr. Barry and the interests he represented were alleging that the eye in this body was a blue eye. I also knew it was going to be suggested by others that the eye was a brown eye. When I went along to the Melbourne Hospital I saw the iris of this eye mounted on a slide. I agree I have not at any time seen the eye before it was mounted on a slide. When I saw the eye slide, the eye was properly mounted with the glass piece over the top of the section of the eye. As to whether the iris of the eye, in its natural state, is very, very slightly concave, it actually rests on the front of the lens. There is very, very little concavity about it. The iris is not a flat surface. If it were suggested if it were not flat it would be concave, I would say it could be

irregular. As to whether an iris is usually described as partly concave, it all depends, if you look at it from in front it is actually convex. I agree this iris, which is either concave or convex, was flattened out on to a slide when I saw it. There are certain conditions under which we see the iris flat in the eye. The iris is pushed forward a little because it is resting on the lens, and if the lens slips back or is removed, the iris flattens out. I agree the condition under which I saw the iris and upon which I am forming this opinion, was that it was mounted flat on to a slide - with one proviso - it was not flat, it was bent a little bit; it was not mounted very well. I cannot say whether the cornea was removed badly, because I was not present. As to whether I saw anything to suggest it was removed badly, I did not see anything at all to form any opinion in that regard. The pigmentation in the stroma of the eye varies in every eye according to the spacing of the pigmentation. In a very brown eye, one gets a density of pigmentation practically all over the stroma. I agree, according to the way the density of the pigmentation lessens, so does the eye in life become a lighter colour. I do not agree that on the iris of this eye there was a great deal of pigmentation. I agree there was pigmentation. If I were asked where I reached the stage when I could draw a line between a great deal of pigmentation and just pigmentation, I would say the thing that impressed me was the contrast. On that eye, there were just a few isolated spots of dense pigment; there was no pigment at all visible anywhere else. If you care to examine my own iris, you will see a similar state of affairs. In the front of the iris on each eye there is a very dense spot of pigment, and no pigment to be seen anywhere else. Asked whether I agree, on the slid of this particular iris there was pigment at different levels throughout the whole specimen, I would say in my description

of the iris I stated that there was no pigment on the front of the iris, with the exception of those few isolated spots. The presence of pigment in dense amount in the retinal pigment epithelium will not make the iris brown. I explained that point at great length during the demonstration in the other room, and that is the reason why I spent such a time because I wanted to make it perfectly clear that the colour of a brown iris was not due to the dense brown pigment in the retinal pigment epithelium, and that a blue iris also has the same dense pigment in the retinal pigment epithelium. I did not measure the thickness of the specimen with the microscope but when focussing down with the lens ^{of the microscope} - I did not take an actual measurement - I observed that one could focus the microscope an appreciable distance before one passed from the anterior surface to the posterior surface. From my experience, that would correspond with the normal thickness of the iris, which is about a millimetre. It would not be any less in thickness when mounted on a slide than before being mounted on a slide, for the following reasons - the eye, together with the rest of the body, had been preserved in formalin; formalin ^{is} ~~has~~ a fixative and has the effect of hardening the tissues. The iris when mounted, I presume, was handled by expert technicians and, when mounting a specimen on a slide, no technician would attempt to force the cover slip down. One holds the cover slip in the other hand applies a spot of Canada balsam and allows the cover slip to fall down by its own weight. If any pressure were made, I doubt very much whether it would compress the tissue because it would be hardened by the formalin. As to the length and the width of the slide as mounted, I did not take exact measurements. I would not agree that the fact of the iris being flattened out on the slide would make a difference to the placing of the pigmentation, whether it was on the stroma or the retinal layer. You are inferring