



## The Leakey Foundation Oral History of Human Origins Research: Yoel Rak

Interview conducted by  
Bernard Wood  
In 2023



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Because it is primary material, oral history is not intended to present the final, verified, or complete narrative of events. It is a spoken account, offered by the interviewee in response to questioning, and as such it is reflective, personal, deeply involved, and irreplaceable.

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It is recommended that this oral history be cited as follows:

Rak, Yoel Interview by Bernard A. Wood 6/27/23. The Leakey Foundation Oral History of Human Origins Research: Yoel Rak. The Leakey Foundation.

Retrieved from: <https://www.leakeyfoundation.org/learn/oral-history>

## **Interview: 6/27/23**

Bernard Wood (00:00:06):

Yoel, it's very nice to talk to you, and thank you for joining us for these oral history interviews. If we could begin, if you could just give us your name and where you last worked, if you are retired, or where you are working now, if you're not retired, the name of the institution and where it's located.

Yoel Rak (00:00:33):

Okay. Well, my name is Yoel Rak and I'm still working at the Tel Aviv University Medical School. Now it's not called Sackler Medical School, remove the name. But still teaching anatomy and teaching human evolution. And I like to teach.

Bernard Wood (00:01:00):

Yoel, it's wonderful to see you, but that's beside the point. But it is wonderful to see you. Could you give us a sense of your family background? Were there any academics in your family? Were you the first to go to college?

Yoel Rak (00:01:22):

No, well my parents, they were born in Poland and they were, unfortunately, during the war they were refugees and they didn't have the chance to study anything. So I'm the first one in my family to go to the university. I myself, I was born in Germany and I was born in a refugee camp after the war in '46. And the age of two, I don't remember anything, but at the age of two we moved to Israel with some kind of a boat. And ever since then, I'm in Israel

Bernard Wood (00:02:21):

And are you an only child. Or do you have brothers and sisters?

Yoel Rak (00:02:24):

No, I have two other brothers. And they were born already in Israel.

Bernard Wood (00:02:32):

Okay. And what are they doing? Are they academic?

Yoel Rak (00:02:44):

No. Actually the tradition of my family, and it goes through several generations, they were curtain merchants back in Poland. And my two brothers, they continued to be me curtain merchants, and they're doing it very well.

Bernard Wood (00:03:07):

Okay. So why are you not a successful curtain merchant? When did you decide that this wasn't for you?

Yoel Rak (00:03:16):

Yeah, no. I was, ever since I was a child, I was interested in natural history. I didn't know much about fossils or about human evolution and things like this. And I collected butterfly and some fossils, sea fossils and things like this. Had a lot of collections. I initiated, by the way, initiated the Israeli Society of Tropical Fish when I was maybe 12. And I can tell that my teachers at elementary school, they were very helpful. And we had a magazine with the stencil that was printed out.

Bernard Wood (00:04:08):

You had to turn the-

Yoel Rak (00:04:08):

Yes.

Bernard Wood (00:04:08):

Okay.

Yoel Rak (00:04:12):

That's right. And so I was always interested. I was a weird guy in terms of business and making money and things like this.

Bernard Wood (00:04:23):

Okay.

Yoel Rak (00:04:23):

So that's what I did.

Bernard Wood (00:04:27):

And so where did you go to high school?

Yoel Rak (00:04:29):

I went to a boarding school. I went to a boarding school, a fantastic boarding school. It was originally, it was for orphans from the Holocaust. But when I attended it was already for Israelis. And I have to say it was a fantastic school. I'm very grateful for this opportunity. The teachers were fantastic. The biology teacher recognized my tendencies, and it was really fantastic. Every Saturday morning we would go to the field and he would teach things that we collected and things like this. It was really fantastic. And by the way, this was in '61. I heard on the... Well, I read in the newspaper, because there was no television at that time, that a Japanese expedition found the caveman in the Amud Cave. And I went, I actually ran away from school and hitchhiked to go and see the first Neanderthal. I mean, Israel was very provincial then. It wasn't only the first Neanderthal, it was the first Japanese that I saw. And it was Professor Suzuki.

Bernard Wood (00:06:06):

Oh, okay.

Yoel Rak (00:06:07):

Yeah.

Bernard Wood (00:06:09):

And when you went to the site, were they welcoming or did you just, "Hi," and-

Yoel Rak (00:06:15):

Oh no, they were very nice. They were very nice. I mean I climbed, you know the Amud Cave is a long climb up. And as I appeared, I saw... It looked like a scene from the Second World War. Everybody was with helmets. And the first time I saw Japanese in my life.

Bernard Wood (00:06:37):

Okay. And so-

Yoel Rak (00:06:40):

It was [inaudible 00:06:41].

Bernard Wood (00:06:42):

...when you were at high school, what did you do as an undergraduate? Why did you decide what you decided and where were you as an undergraduate?

Yoel Rak (00:06:53):

Well, I was in Jerusalem. It was in the pre-history department. And again, I already found out that my interest is really in human evolution and evolution in general. And my teachers Ofer Bar-Yosef and Ayten Cherhanov and other people, they helped me a lot in concocting a program that will fit, including anatomy. And...

Bernard Wood (00:07:34):

And so how many other students were there in pre-history?

Yoel Rak (00:07:38):

Oh, in prehistory there were about maybe 15, but I went my own way.

Bernard Wood (00:07:45):

Okay, I see. And so in Israel, how long is the undergraduate degree course?

Yoel Rak (00:07:54):

It was four years. Three of them I actually spent in the anatomy department in Tel Aviv. And I actually drove from Jerusalem three times a week. And at the end we went, Ofer Bar-Yosef and Naama, Naama Goren at the time, we went to Africa for the first time. We were guest in Mary Leakey's Olduvai expedition.

Bernard Wood (00:08:26):

And when was this?

Yoel Rak (00:08:28):

This was '72.

Bernard Wood (00:08:30):

'72. And they took you when you were an undergraduate?

Yoel Rak (00:08:37):

Yeah. At the end of my undergraduate, yeah. It was a fantastic trip. And we were greeted fantastically, Mary Leakey and Richard Leakey, and Meave Leakey at the time. And the two kids were this size.

Bernard Wood (00:08:59):

Yeah. Well, believe it or not, I remember seeing you. Although you and I didn't meet until, well, a little later. But I remember the party from Israel. And so what did you decide to do? You had an undergraduate degree, you had a bachelor in science. You were a bachelor of science?

Yoel Rak (00:09:27):

So I decided to go on for my masters in anatomy. And it was for a whole year I was studying anatomy, the intensive course together with the medical students. And then unfortunately, the war of '73 broke out. And I was in reserves across this West Canal for almost nine months. And it was very obvious that in order to complete my studies, I have to go somewhere else. And Glynn Isaac, and this was back in Africa, Glynn Isaac suggested that I should go to Berkeley. And-

Bernard Wood (00:10:16):

So that was Glynn's suggestion. And presumably you were put in touch with Glynn by Ofa?

Yoel Rak (00:10:28):

Say it again?

Bernard Wood (00:10:33):

Who made the connection between you and Glynn?

Yoel Rak (00:10:37):

Oh, I met Glynn in the field there. We spent several weeks in the field and we had a very nice report. And he told me that I should go and have my graduate studies with Clark Howell.

Bernard Wood (00:10:56):

Okay.

Yoel Rak (00:10:57):

And I knew Clark Howell from the literature only. And yeah, it was very exciting times.

Bernard Wood (00:11:06):

So you just wrote to Clark Howell and said you want to be a graduate student?

Yoel Rak (00:11:12):

Yeah. I wrote to Berkeley, the university, and I said I would like to be with Clark Howell. And at that time, Washburn and Desmond Clark and all these guys were... And I was accepted. And frankly, I was so scared. I was so scared. Deep in my heart I was hoping not to be accepted.

Bernard Wood (00:11:43):

Was this the first time you had left Israel?

Yoel Rak (00:11:46):

No, no. No, I-

Bernard Wood (00:11:48):

No, because you have been to Africa. Yeah.

Yoel Rak (00:11:49):

Yeah. And I got married before. And my wife originally, she's an American, so we went to visit there.

Bernard Wood (00:11:59):

Okay. Yeah.



Yoel Rak (00:11:59):

Yeah.

Bernard Wood (00:12:03):

And so you were a graduate student with Clark Howell. Who were his graduate students at the same time as you? [inaudible 00:12:13]

Yoel Rak (00:12:13):

Oh, it was really the heyday of paleontology, the way I perceive it. It was fantastic. First of all, there were fossils from Ethiopia. And the students were very enthusiastic and very nice to me. And I had the greatest time then. And the students, Noel Boas was one of them, and Russ Ciochon, and others that kind of disappeared later. Judy Tate and other people, I'm trying to think. Mike Schwarz and other people. But it was very nice. Every time the Journal of Human... I'm sorry, the AJPA appeal, we all discussing all the articles and we were screaming at each other and discussing things. It was really fantastic.

Bernard Wood (00:13:20):

So how did Clark Howell advise you? Can you tell us what it was like to be a graduate student of Clark's?

Yoel Rak (00:13:28):

Yeah. Well, just after I came, this was maybe the first day... But the first week in Clark Howell's lab, and I was shown a reconstruction of a skull. This is from the Omo. And my gosh, I saw that the mastoid is actually a great trochanter, of a bovid. And the article went already to AJPA. And I didn't know what to do. I consulted my father-in-law. Because you know, as right as you may be, people don't like it. And after a week, I came to Clark Howell and I told him, "Listen, I think, I'm sure I'm wrong, but I think," and all this. "I think it's a mistake. There is no mastoid, but it's a greater trochanter." And he say, "Show me." We went to the safe. And I told him, "It's impossible. No air cells, nothing. It's not a mastoid." And he picked up the phone to the AGPA and called the article back. He says, "You are right."

Bernard Wood (00:14:58):

Wow.

Yoel Rak (00:14:58):

And this is Clark Howell. This is really Clark Howell.

Bernard Wood (00:15:02):

Okay. And then-

Yoel Rak (00:15:03):

And then... Yeah.

Bernard Wood (00:15:05):

No.

Yoel Rak (00:15:06):

And then... You want me to continue?

Bernard Wood (00:15:11):

Yes, please.

Yoel Rak (00:15:12):

Yeah. So at that time, Clark Howell had to ship back all the fossils that were in his lab to Ethiopia. And he came to me and he says, "Listen, there is the baby Zinj," this little calotte, actually, it's the two parietal and occipital of a young boisei. He says, after he saw that I know some anatomy, he says, "Would you like to describe it?" And I said, "Sure." And this is how my career started.

Bernard Wood (00:15:55):

And that's what you did for your thesis?

Yoel Rak (00:15:58):

What?

Bernard Wood (00:15:59):

That is what you did for your PhD or that was... Well, that was in addition to your work on the face?

Yoel Rak (00:16:11):

With this baby Zinj, as we called it, I fell in love with boisei. I mean, this is an old love of mine. And originally I thought to write my dissertation about the face because so much of the robust characteristic is in the face. And the original title was The face of the robustus Australopithecines. And Tim White who came to Berkeley at that time, he says, and he was my advisor as well, he told me, "You should include afarensis and africanus." And so it became the face of those Australopithecine.

Bernard Wood (00:17:05):

But the book that you wrote can only have been written by somebody who knows a lot of anatomy.

Yoel Rak (00:17:21):

Yeah.

Bernard Wood (00:17:22):

And where did you get... The illustrations in that book, are they yours?

Yoel Rak (00:17:30):

Well, I guided the, a dear friend of mine and a dear friend of Clark Howell, Judy Ogden. She was the artist. And she was a fantastic artist, not only artistically but willing to listen to me, which is also an achievement. And she was very patient. And I went through these composites. I went through hundred times to correct things, and she followed my advice.

Bernard Wood (00:18:16):

But one of the things that really, really impressed me about that book was the knowledge of the whole thing. In other words, this has to move and so on and so forth. The other thing that impressed me, my copy of the Australopithecine face is really battered. But the other thing that impressed me was that there weren't many numbers in that book.

Yoel Rak (00:18:51):

Yeah. Well, what's her name? Elizabeth Felba, which was in charge then. And I was in the brick safe, you remember there were red brick safe in Pretoria. And she told somebody else there, "This Israeli is looking at the skull all day long and doesn't write anything." And so I told them later, we became very good friends. I told her, "Yeah, that's what I'm doing. I'm looking and trying to see, instead of trying to measure."

Bernard Wood (00:19:34):

Okay. But the problem, Yoel, is that there aren't many of you. And I think the ability to just look at the morphology and try and understand, and the fact that you have to look at it for hours on end. I mean, I'm not as good as a morphologist as you, and you know more morphology in your little finger than I do. But it always struck me that you need to look at fossils and you need to look at them again. And they're trying to talk to you. But how did you know how to listen?

Yoel Rak (00:20:20):

What?

Bernard Wood (00:20:22):

How did you know how to listen? In other words, you were looking at these fossils.

Yoel Rak (00:20:27):

Yeah.

Bernard Wood (00:20:27):

They have a message for us. And how did you know what that message was?

Yoel Rak (00:20:38):

How to say? But one thing that I do, for example, and the late early Charlie... What's his name? Charlie-

Bernard Wood (00:20:47):

Lockwood.

Yoel Rak (00:20:50):

Yeah. I liked him very much because he was doing the same thing. We were drawing the fossils. And by drawing the fossils, it's forcing you to pay attention to the anatomy. And I think part of it was this. I mean looking for hours and hours, and trying to phrase the topography and the structures there. I mean eventually came up with ideas. And I know I would reveal my age if say what I'm going to say, that the youngsters, scientists today, they are coming with the micro scribe and start measuring. Like they're measuring without understanding what they're measuring. I know I sound like an old man, but it's what I don't like.

Bernard Wood (00:21:58):

Well you sound like, as my children say, "Dad, you are being a boring old fart." But I completely understand what you're saying, that you have to look at these things a long, long time in order to understand. Because the morphology of boisei is very unusual, and so there is no comparative material that's really much use.

Yoel Rak (00:22:27):

Yeah. Yeah.

Bernard Wood (00:22:30):

So when did you do your PhD and who was... so your advisors were Clark and...

Yoel Rak (00:22:35):

And Tim.

Bernard Wood (00:22:37):

Tim White.

Yoel Rak (00:22:38):

Yeah.

Bernard Wood (00:22:38):

And then who were the examiners of the PhD?

Yoel Rak (00:22:44):

The anatomist in Berkeley was Professor Srebnik.

Bernard Wood (00:22:48):

Right.

Yoel Rak (00:22:52):

And Clark Howell and Tim White. And...

Bernard Wood (00:22:59):

Then did they advise you to approach the University of Chicago Press to get it published?

Yoel Rak (00:23:06):

No. Tim White... After my dissertation was finished and I was already in Israel, and Clark Howell, sweet Clark Howell called me and told me that my dissertation is very nice, and I'm very thankful for it. And Tim White liked it as well, which is not a easy thing. But he called, what's his name? Woodcock. Woodcock was academic press editor. And he told him, "Listen, you have to publish this book."

Bernard Wood (00:23:47):

Okay.

Yoel Rak (00:23:48):

And this is how.

Bernard Wood (00:23:49):

Okay. So it was really Tim's intervention that got it published in the academic press?

Yoel Rak (00:23:56):

Yeah, it was Tim and Clark Howell, because Woodcock was a very good friend of Clark Howell.

Bernard Wood (00:24:03):

Okay. Okay. It was my mistake. I thought it was the University of Chicago Press. I should have had it in front of me, and not have relied on my memory. So you were married, you

were a graduate student in the States, you needed to put some food on the table. So what sort of job did you get and how did you get it?

Yoel Rak (00:24:31):

Well, again, it was Clark Howell that gave me a research assistant. I was in charge of casting and to do cast in the old way, not through CT scans. But the old way, you pay a lot of attention to the anatomy. For example, I don't know if you recall the squamosal suture-

Bernard Wood (00:24:58):

Yes.

Yoel Rak (00:25:01):

...of boisei?

Bernard Wood (00:25:03):

It overlaps.

Yoel Rak (00:25:05):

Overlap, yeah. And it was just because of the cast. You paint the cast and you see that something is going on there. So it's this intimate relationship that you have through the cast, even more than the originals. Because when you paint it, it highlights everything.

Bernard Wood (00:25:30):

Okay. So you were a research assistant at Berkeley?

Yoel Rak (00:25:37):

Yes. And it was a modest sum of money. I got married student housing, and that was also very cheap. And I managed. Every month when I got my salary, I went and bought the book, because at the end of the month, whether I bought it or not, I didn't have money. So at least I have the book.

Bernard Wood (00:26:07):

Okay. And so when did you get your PhD? Just remind me.

Yoel Rak (00:26:14):

1981.

Bernard Wood (00:26:16):

Right.

Yoel Rak (00:26:16):

I believe, yeah.

Bernard Wood (00:26:19):

And then when did you go back to Israel?

Yoel Rak (00:26:23):

In '90.

Bernard Wood (00:26:24):

Okay.

Yoel Rak (00:26:25):

I was in Berkeley from '75 to '80. While my dissertation was considered, I went back to Israel. And I already started teaching anatomy in the medical school. They accepted me. And-

Bernard Wood (00:26:46):

So you were teaching anatomy in the medical school at Berkeley, or in Israel?

Yoel Rak (00:26:53):

No, in Tel Aviv. In Tel Aviv.

Bernard Wood (00:26:55):

In Tel Aviv. Okay. And that's what you've been doing your whole career?

Yoel Rak (00:27:00):



Yes. And field work in-

Bernard Wood (00:27:06):

But in terms of employment, how did you start? What level did you start at the university in Tel Aviv?

Yoel Rak (00:27:18):

Yeah. When I went to Berkeley, they told me, because maybe otherwise I wouldn't go, but they told me if I will excel and I will be fine, they will accept me in the medical school. They will give me a position.

Bernard Wood (00:27:38):

Okay.

Yoel Rak (00:27:40):

Which was very reassuring.

Bernard Wood (00:27:43):

Okay.

Yoel Rak (00:27:45):

Yeah.

Bernard Wood (00:27:45):

And what was that position, you were a lecturer?

Yoel Rak (00:27:49):

Yeah, I was a lecturer. And as I told you, I like to teach and I like to teach anatomy. And then I taught a very popular course in the medical school about the fossil evidence for human evolution.

Bernard Wood (00:28:08):

Okay.

Yoel Rak (00:28:10):

Yeah.

Bernard Wood (00:28:12):

So let's go over to research. So you were now back in Israel, and you had been to the field, but you had never done your own field work, is that correct?

Yoel Rak (00:28:31):

Well, before I went to Berkeley, I was excavating in Hayonim Cave.

Bernard Wood (00:28:40):

Okay.

Yoel Rak (00:28:40):

Yeah, and I was excavating in Ubeidiya. And as a matter of fact, excavating in Ubeidiya for six years. So I had the experience... There is nothing in Ubeidiya vis-a-vis fossils, human fossils. But in Hayonim, we were excavating Natufian graveyard. And it was really a very important incentive for me to continue in this field.

Bernard Wood (00:29:19):

And so you liked being in the field, you liked excavating, you liked finding things?

Yoel Rak (00:29:27):

Yeah.

Bernard Wood (00:29:28):

And you had this love of anatomy and love of anatomy teaching. So what was the next sort of event in your research career?

Yoel Rak (00:29:43):

Well, as I come back, and this is again thanks to Clark Howell, he told me that Kebara has to be excavated after many years that it wasn't excavated. It was excavated in the '60s. And he told me, "Don't worry, we'll get you money." And it wasn't, I mean it was together with Vandermeersch, and with Ofer Bar-Yosef, and Baruch Arensburg that the excavation in

Kebara was actually renewed. And in '83 we found the Neanderthal with the pelvis and everything. I mean, unfortunately, there was no face there and everybody was grabbing another piece. And I was left with the pelvis.

Bernard Wood (00:30:47):

I see, I see, I see.

Yoel Rak (00:30:48):

Yeah.

Bernard Wood (00:30:49):

So you-

Yoel Rak (00:30:50):

And it turned out to be a real pleasure under the belt. A fantastic pleasure.

Bernard Wood (00:31:00):

Right. And then after that, how did you get involved back in Africa?

Yoel Rak (00:31:06):

Well, this was Tim White, and of course Bill Kimbel, my dear friend. They asked me to come as an anatomist still. And during the '80s, there was nothing to do there because of the war and the famine and things like this. But in the '89-

Bernard Wood (00:31:29):

There being Hadar?

Yoel Rak (00:31:29):

Yeah, the Hadar. Yeah.

Bernard Wood (00:31:29):

Okay.

Yoel Rak (00:31:36):

And so I joined them and it was a pleasure. It was a pleasure.

Bernard Wood (00:31:44):

I mean it's like, if you like anatomy, it's like being in the biggest choice shop in the world.

Yoel Rak (00:31:50):

That's right.

Bernard Wood (00:31:51):

I mean, there's a lot of anatomy. And so you worked pretty closely with Bill Kimbel. How did that begin? How did that association begin?

Yoel Rak (00:32:06):

Say it again, I'm sorry.

Bernard Wood (00:32:08):

I'm sorry. How did the association with Bill Kimbel begin?

Yoel Rak (00:32:14):

Okay. Well, we became very good friends when Clark Howell called him and he said, "There is this strange Israeli here that I want him to see the forensic staff that was already in Cleveland, and can you host him?" And he says, "Yes." And I came and we became good friends. And part of it, I mean not part of it, but major thing is that we saw anatomy the same way. It's really very unfortunate what happened. But we were very good friends.

Bernard Wood (00:33:05):

So you were on the same sort of wavelength in terms of morphology?

Yoel Rak (00:33:10):

Yeah.

Bernard Wood (00:33:10):

Okay.

Yoel Rak (00:33:10):

I remember he showed me AL 45, the base of the skull. It was incredible. I was looking at a chimp. And except the foramen magnum, of course. And both of us, we were screaming. Fantastic. And then he was writing his dissertation and I was writing my dissertation. And we were spending nights, very late nights, sitting in his living room and discussing and screaming at each other and arguing about a lot of things. But we saw things the same way.

Bernard Wood (00:34:07):

And then how about the work at the excavations at the cave at Amud?

Yoel Rak (00:34:15):

Amud, yeah. Well, I told you the story about my first visit to Amud. And then it was Bill Kimbel who actually told me that we should find a project together with the IHO and the Hebrew University and Tel Aviv University, and we should reestablish or re-excavate the cave. Because there were a lot of questions to be answered. When the Japanese excavated the place I mean, there was no carbon 14, and the dates were very misleading. And they will show that what they found is an intermediate between a Neanderthal and modern Homo sapiens. And that's why the dates were important. Because for them, they assigned it to 20,000. Exactly a link between these two.

(00:35:25):

So all these things we decided to check. And I like the cave. First of all, it's a spectacular cave. And the second thing, it's a cave with the bottom. We knew that there is a bottom to the cave. And a lot of information was actually provided by the Japanese. The green was everything like theirs. And luckily, fortunately at our second season we found the baby Neanderthal. That was a great discovery. Because for me it was fantastic because nine month old individual, you could tell it's a Neanderthal. I mean, this is something that with the Taung baby, there was a discussion there. Here, you could tell it's a Neanderthal, per excellence. So we were very lucky. And now we have dates and we have the stratigraphy and Erella Hovers. She's a fantastic field archeologist. And we solved a lot of problems there. A lot of questions.

Bernard Wood (00:36:52):

And so you and Bill were working on Neanderthals, and then you were also working on *Australopithecus afarensis*. Do you think those two interests were sort of complimentary, or was it morphology that they had in common?

Yoel Rak (00:37:17):

Well, I always tried to convince Bill to expand a little bit his interest. And he came with Jay Green, and he became very enthusiastic about it. And especially he wasn't with us when we discovered the baby. I called him and he flew immediately with jet lag and all these trying to clean everything. And he was very enthusiastic. For him, yeah, it was a touch of something else, you know?

Bernard Wood (00:38:02):

So you have continued to use your extraordinarily well-developed knowledge of morphology to make suggestions, to come up with different interpretations. So does your research career, when you were making decisions about what to be interested in, what were the major factors? Were you interested in so much that you had to limit what you actually did? Or did you have to work hard to find the things that you would be interested in?

Yoel Rak (00:38:59):

Well, as I told you, after looking at the fossils for a long time, ideas are crystallized in your head. And when I was a graduate student in Berkeley, everybody was so eager to add more stages to human evolution. And of course, everyone was hoping to be a discovery of one of these stages. This was a very naive approach. And everything was, in a sense, everything was anagenetic. And I found in recent years, or let's say after my PhD, I found my interest. I mean, I was more interested in the functional interpretation of the face or the pelvis or the mandible and things like this. I personally think that it's a much more challenging and much more interesting job to do.

(00:40:23):

And I mean, we don't need the record of *Homo sapiens* or the record of our evolution to deal with evolution. Evolution can be treated, and it's very obvious that we evolve in a Darwinian way. So this is not the issue. The issue is really to try to interpret. For example, I mean, I'm still amazed that a boisei with this massive mandibles and massive face, the brain case walls is amazingly thin.

Bernard Wood (00:41:10):

Thin.

Yoel Rak (00:41:12):

Yeah.

Bernard Wood (00:41:13):

So-

Yoel Rak (00:41:15):

I mean, this is a fantastic observation and I don't know the answer. And it's a very interesting solution.

Bernard Wood (00:41:29):

So my impression of your research is that you look at the morphology of the fossils and you are mentally reconstructing them as living individuals.

Yoel Rak (00:41:49):

That's right. That's what I do.

Bernard Wood (00:41:52):

Yeah, but that's what you do. Okay. You have talked a lot about the opportunities that Clark Howell made for you and also Tim White. Do you see that still going on? Do you see people being as generous as that these days?

Yoel Rak (00:42:20):

As I always tell my student, it's much easier to publish the paper as a student than as a professor. So as a student, they're much more forgiving than these days.

Bernard Wood (00:42:39):

Yes, yes.

Yoel Rak (00:42:41):

But there are, I enjoy a lot of friendship from everywhere. And even though, for example, I mean my interpretation of *A. afarensis*, for 30 years I was sure that *afarensis* is leading to us. And then I came to the conclusion that it should be an initial stage of the robusts. I mean, Bill Kimbel and Joe Hanson were on the paper but they removed their name.

Bernard Wood (00:43:20):

Yes.

Yoel Rak (00:43:24):

But we still are very good friends. You know, you don't have to kill each other.

Bernard Wood (00:43:30):

No, no, no. So which other researchers, I mean, you've spoken about Bill and you've spoken about Clark. Which other researchers do you admire?

Yoel Rak (00:43:47):

Well, in the past you mean?

Bernard Wood (00:43:49):

Yes.

Yoel Rak (00:43:51):

I admire Le Gros Clark.

Bernard Wood (00:43:54):

Right.

Yoel Rak (00:43:57):

I mean for me, he was a major figure when reading his stuff. I never met him. The Antecedents of Men, and what is it? Ape-Men and Men-Apes, and the Fossil Evidence for Human Evolution. Fantastic, fantastic stuff. And the other one was Weidenreich.

Bernard Wood (00:44:29):

Right.



Yoel Rak (00:44:29):

Yeah. And-

Bernard Wood (00:44:32):

Did you meet Weidenreich?

Yoel Rak (00:44:33):

No, no, no.

Bernard Wood (00:44:34):

No, no, no. I mean... [inaudible 00:44:40]-

Yoel Rak (00:44:37):

Clark [inaudible 00:44:40]

Bernard Wood (00:44:39):

Yes, I know. Yes. Yes. And what attracts you about Weidenreich? He was a consummate morphologist.

Yoel Rak (00:44:52):

Yeah, that's what he did. I mean, this is why I so admire him. Because he noticed, he paid attention and he detected all these things that nobody see them. I mean given the time that he was living, he was an anagenecist and everything was... But interestingly enough, and he called *Homo erectus*, he called *Sinanthropus*.

Bernard Wood (00:45:29):

No, no.

Yoel Rak (00:45:34):

So you have to take his ideas with the grain of salt today. But he was a fantastic morphologist.

Bernard Wood (00:45:47):

Okay. And can I ask you the desert island question, if you had to rescue one of your publications, which would it be? What's the publication that you are proudest of?

Yoel Rak (00:46:08):

Yeah. Well, I still think that Australopithecine face is... It was a fantastic intellectual experience. And I'm still very proud about it. The other one is the ramus of *A. afarensis*, what shall I say?

Bernard Wood (00:46:48):

Right. No, I mean, I think the Australopithecine face is... The description of books or papers being classic or seminal is really overused. But the Australopithecine face, I think, is just really exceptional.

Yoel Rak (00:47:06):

Yeah.

Bernard Wood (00:47:07):

So can I ask you, can you think of a paper that was written by somebody else that you wish you had written?

Yoel Rak (00:47:19):

Yeah, this is *Zinjanthropus*.

Bernard Wood (00:47:27):

The Tobias monograph?

Yoel Rak (00:47:29):

The Tobias monograph, yeah. I grew up on this monograph, and I mean obviously, I don't agree with everything there and all this. But yes, it would be a fantastic dream to given this skull, to be asked to describe it and to analyze it and things like this.

Bernard Wood (00:47:56):

Right. And another question, which is subjective. If you had a fairy godfather, what research question would you ask him? Or a fairy godmother. What would you like to know the answer to?

Yoel Rak (00:48:21):

Well, I think to sort out the wish basket that is called Homo erectus. Which is still a big mess, in my view. There is not a consensus who is in the basket. And even more, there is no consensus about the phylogeny of these how is OH 9, and some people put Bodo into it. And then of course you have the Pithecanthropus, too, and you have the Sinanthropus and all these things. It's a big, big mess. Which means, in my view, it means that there are more species in human evolution that are actually side branches than those... How shall I put it? There are more individual, more fossils that represent side branches that has nothing to do with us than fossils that are actually leading to us.

Bernard Wood (00:49:38):

Okay. Well, that's my prejudice-

Yoel Rak (00:49:41):

What-

Bernard Wood (00:49:42):

I think that is my prejudice as well. And so can I ask you, if somebody gave you a lot of money, what research would you either spend it on or would you advise them to spend it on?

Yoel Rak (00:50:02):

Well, you are immediately tempted to say that I'll spend the money in excavating new expeditions and things like this. But Michael Ghiselin, said he will buy a new lawnmower. When he got the, what was it, MacArthur prize, he said, "I'll buy a new lawn mower." But I would dedicate some of the money to finite element techniques. And I'm too old to start with it now, but I'm amazed about the potential of these techniques to answer questions that I was interested as a graduate student for the anterior pillars and things like this.

(00:51:00):

These are questions that finite element lab with talented and mechanically inclined people can answer these things. Like Callam was, for example, and things like this.

Bernard Wood (00:51:22):

Yes, yes.

Yoel Rak (00:51:23):

This is one thing that I would do. The other thing, I would go back to all these collections and reexamine things again. Because you always think about things that are new for you, and you didn't have an idea when you were young and innocent thinking about it.

Bernard Wood (00:51:52):

Yes.

Yoel Rak (00:51:53):

Yeah.

Bernard Wood (00:51:55):

So what part of your working life did you most enjoy and what part would you have been really pleased to have been rid of?

Yoel Rak (00:52:04):

I couldn't hear you. Sorry

Bernard Wood (00:52:08):

What part of your working life did you most enjoy, and what are the parts that you would've been glad to have been rid of?

Yoel Rak (00:52:18):

Yeah. Well listen, I mean, obviously the discovery of 444, it's a climax in one's career. And the variants exciting thing. But nevertheless, I mean, studying it and cooperation with Bill and with Don Johansson. I was sitting in my lab in Tel Aviv and studying the way I was doing science, the way I imagined it as a child, sitting and looking at and calling Bill in the middle of the night and arguing about the TMJ and things like this. This was a highlight of my

career. This is the way I viewed in a very stereotypic way, science, doing science. So it was the discovery in the field and the-

Bernard Wood (00:53:31):

And the analysis.

Yoel Rak (00:53:32):

The analysis in the lab, and the cooperation with Bill. Really, it was a climax of my...

Bernard Wood (00:53:39):

Okay. No, I can appreciate that. When you're not working, what do you do, Yoel?

Yoel Rak (00:53:50):

Well, I like to read the science books. I like to read Dawkins. I like to read the Stephen Gould and other people that explain in a popular way, explain evolution. And I enjoyed that a lot. I enjoy. I met Dawkins, he came here to give a lecture. I told him, for heaven's sake, he writes faster than I can read.

Bernard Wood (00:54:29):

And so what about the tropical fish?

Yoel Rak (00:54:32):

The tropical fish are... When I had my dog and he died, I said, listen, the next pet that I will have is a guppy. Because I was so heartbroken. And now I have fish and when they die I'm sorry about it too.

Bernard Wood (00:54:54):

I see. Yoel, if you had not been a paleo anthropologist, what would you have done instead? If somebody had told you that you couldn't do it?

Yoel Rak (00:55:08):

Yeah, well listen, I mean, sitting in the huddle at night and we were joking, Bill and I, we were watching the insects spinning around the...

Bernard Wood (00:55:22):

Lamp.

Yoel Rak (00:55:23):

Billions. We decided our next life will be entomologist. It's much easier.

Bernard Wood (00:55:33):

But are you serious? In other words, if you had not been a paleo anthropologist, what was your other career?

Yoel Rak (00:55:43):

Yeah, seriously. I think bats. Bats. I would love to study bats.

Bernard Wood (00:55:51):

Okay. But you would've been-

Yoel Rak (00:55:53):

Because they are so specialized-

Bernard Wood (00:55:54):

...natural historian of some sort. I'm sorry, you finish.

Yoel Rak (00:55:59):

No, I'm saying because they're so specialized and so fantastic. I was always intrigued by bats, but this will be my second life.

Bernard Wood (00:56:15):

So do you think Australopithecus boisei is a sort of bat equivalent of a primate? It's just weird and strange.

Yoel Rak (00:56:26):

Yeah. It's so intriguing. And so I remember when I figured out the wider shape of the... And what it means. I remember I was in the Plums Hotel in Nairobi. That now it's a whole house.

But I was there and I was drawing this and suddenly, and I was bending a page. And I realized what it is and then how fantastic it is that a hominid actually adopted it.

Bernard Wood (00:57:08):

Right. Okay. So is there anything that you would like to talk about that I haven't raised with you?

Yoel Rak (00:57:19):

Well, one of the questions that you didn't ask me if I regret something that I did?

Bernard Wood (00:57:24):

Yes.

Yoel Rak (00:57:26):

Okay. So yeah, I regret three papers. And ironically, they appear in Science and Nature.

Bernard Wood (00:57:35):

[inaudible 00:57:40]

Yoel Rak (00:57:41):

One is the Dmanisi skull.

Bernard Wood (00:57:43):

Right.

Yoel Rak (00:57:45):

The other one is the hyoid of Neanderthal. And the third one is the tempo and mode in human evolution, which today I would have a completely different view of these things.

Bernard Wood (00:58:05):

And why has your view changed?

Yoel Rak (00:58:11):

I guess as you get blonde, more blonde, maybe you become more wiser. I hate to say it, but...

Bernard Wood (00:58:24):

Okay.

Yoel Rak (00:58:25):

For example, my teaching, I'm volunteer teaching now, and I'm doing it because, if I may say so, I'm so much smarter and more experienced, and I see things differently that it's a shame not share it with the students.

Bernard Wood (00:58:51):

Okay. Yeah, I mean there is something that... I'm trying to think of the discussion between a son and his father, and the son realizes that his father has become a lot wiser in his old age.

Yoel Rak (00:59:15):

Yeah.

Bernard Wood (00:59:22):

Just to check, is there anything else that you would like to share with us before we finish?

Yoel Rak (00:59:28):

No, that's about... Thank you for the interview.

Bernard Wood (00:59:33):

Yoel, it's been wonderful and I just wish we had spent more time together. But it's just wonderful to see you. And just as you admire Phillip Tobias and Weidenreich as morphologists, there are many of us who admire you for the same thing. So-

Yoel Rak (00:59:56):

Thank you.

Bernard Wood (00:59:58):



...many, many thanks.

Yoel Rak (00:59:58):

My gosh. Thank you. Thank you.

Bernard Wood (01:00:02):

Yoel, stop the recording and we can just spend a few minutes. It was wonderful to talk with you, it was... The picture was very clear, and-

Yoel Rak (01:00:15):

It was wonderful to see you.

Bernard Wood (01:00:17):

Hmm?

Yoel Rak (01:00:17):

It was wonderful to see you. And thank you for everything. And you know what I mean.