

Papez: an interview with Dr. Raymond Dart
in Philadelphia, May 21, 1981

KEL: What I am most interested in knowing is your recollections of James Papez.

RD: Papez was apparently the source of MacLean's appreciation of things - and Papez was certainly aware of what I had done. The extent to which he was affected by that, I don't know because he was in the clinical field and the basic sciences. I wanted to ask you what are your present ideas about fundamental questions from the anatomical and developmental point of view? For example, what is your feeling about some of my work, have you read any of my papers?

KEL: Yes, though not extensively, when I was with Paul MacLean in December, he showed me the paper you published in 1935 on emotion, it had an interesting bearing on Papez's subsequent paper in 1937 on emotion.

RD: Yes, but what do you feel now about the muscles? Are you aware of their double innervation, for example?

KEL: I'm not sure you would have to discuss it further

RD: Well these are the important things I should know for our discussion - where we differ and what we accept and agree upon. Do you remember or are you familiar with William Hiss who was the originator of neurological ideas about the dorsal neural tube giving origin to the whole of the nervous system.

KEL: Yes, I know something of that from embryology.

RD: What I think I must do is go back to that because this is fundamental. Also Virchow, are you familiar with his life?

KEL: A bit.

RD: In what way are you familiar and in what way neglectful?

KEL: Mostly neglectful, I'm sure. It was only in transit through medical school that I had that exposure.

RD: Well now these are the grey areas in which we are apt not to have a common understanding: Virchow. Virchow was a profound and active denier of Darwin. Now I don't know what your attitude has been toward Darwin and evolution. The point is not what you have heard other people say, but what you believe yourself.

KEL: I believe Darwin's basic position was correct.

RD: ~~Well Virchow was a most brilliant man. As you may recall he was the founder of the cellular theory of pathology. He introduced the basic words and descriptions of the cellular ideas so his work was fundamental importance.~~
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RD: Well, Virchow was a most brilliant man. As you may recall, he was a the founder of the cellular theory of pathology. He introduced the basic words and descriptions of the cellular idea so his work was of fundamental importance. He was also an apponent of Darwin and disliked him. He did everything he could to prevent Darwin's theory from being accepted in Germany, and he did not give two hoots about the Count von Bismark. He made a tremendous opposition to Darwin all over the world. He did everything he could to ruin those people who followed Darwin, especially in Germany. Probably no one has done more to arrest the understanding of what Darwin was driving at than Virchow.

As one means of doing that, he founded the Anthropological Society in Germany. He was the man who went out along the Dardenelles to discover with that other German archeologist, the site of Troy and so on. so there is no question about his brilliance. But today we are far beyind the cellular theories of human origen- we know it goes back to chemistry and to physics, and the state of the earth and a million things which were unknown then. And, of course, unfortunately, Virchow dominates pathology, still with it people being aware of it. But most regretable are the facts about Hiss. Hiss has trained neurologists ever since and they still believe it- that the neural tube gave origen to the neural system. Well, from the evolutionary point of view, that is absolutely in reverse. This is unfortunate but true. I don't know how well people know of it today. I did my best, but only for a short while before I was thrown out of England into South Africa which was the last place on earth I had wanted to be associated with. (Laughing). But after the first world war Britain had been deprived of anatomists. Therefore Elliott Smith, who had been taken in, as you know now, he and Sir Arthur Keith over the Piltdown man which had been deliberately "solved" by another brilliant man "Sollace" If you are aware of this you will begin to understand the confusion that has arisen in our profession - our common professors. It is, of course, terrible but unavoidable because these men were honest in their opinions and they were brilliant men. But of course, they were incapable of knowing the future. The result was that when Shellshear and I wrote a paper showing as far as histology could show in the twenties, the anterior cells of each - dorsally in the became incorporated in the neural tube.; and that is where the motor nerves originated - in the itself. Just as previously- way back in the coelenterates, the nervous system, that was the beginning of the sympathetic nervous system. This was so tremendous a postulate and proof that nobody accepted it. They havn't even accepted it to the present day.

1912

And, of course, the next horror so far as Dart was concerned and the name of Dart, was Australopithecus. It took fifty years before I was invited to America to lecture, by people who had recognised the truth of that.

And I also maintain the belief in the stone tools and how they originated. Whether you had read any of these things, I don't know. A bit, well perhaps reading more will help you.

This is a letter I received from the Director of the Transvaal Museum who was opposed to my belief that man recognised the value of bones before he recognised the value of stone as an implement. Is it clear to you? Take your time.

KEL: That is very interesting. (the letter recognises the correctness of Dart's theory of man recognising the value^{of} bone as a tool).

RD: Yes he is an honest man. They were using bones as knives- to do anything with, as sharp tools. The letter is very recent. As you know, my life is decided, three months here, three months in South Africa, a second cycle and the year is over. I may or may not see people at either end. I should have received that letter before I left. As he says in the letter he will publish an article stating this position about the priority of tools.

KEL: What do you think of Judson Herrick's concept of the medial and lateral orientations of the cerebral hemispheres?

RB: Well, he was responsible for the " trouble ". I am glad you know about Herrick. And also the three women^{he} trained who produced the standard text book of neurology for America and the world. It dominates neurological thinking at present. This is why I am approaching this in this way. I want you to know the worst about me.

KEL: ^{Is} Elizabeth Crosby one of the three pupils of Herrick you mention ?

RD: Yes. Elizabeth Crosby was ~~xxxxx~~ Herrick's most important protégé. The book is up here. But what I wanted to know is what you believe and what you don't believe, do you follow?

Kel: I have only been involved in retrospect. I was interested in Papez first. I had known a bit about Herrick before. But I was interested in how Herrick's concept of the medial wall being related to the hypothalamus and the lateral wall being related to the dorsal thalamus. That orientation fits very well with what Papez said later, and also from a clinical point of view, what Yakovlev said later about the basic pattern of what we call the limbic system.

4

RD: Well I have had prepared for you a list of the papers I wrote which are fundamental to my interest. My ideas about things have not changed but have ripened with the passing of time. Of course these ideas did not have an effect on the neurologists of that period because of that divergence of opinion. The outlook of all English speaking neurologists and some others as well, has been dominated by the Hiss doctrine.

I want to first show you that it was nonsense, they did not have the observations we have now to enable them to learn differently. But in the first place I should have been recognised earlier. But Sherrington didn't do his work until the close of the last century.

KEL: Where do you place Sherrington in this context?

RD: Well Sherrington I wrote against and the physiologist in University College where I was. I don't know if this is of any use to you?

KEL: Oh, of tremendous use. I am most interested. I gather that Papez, Herrick, Sherrington all represent a strain of thought that is very different from yours.

RD: Yes, It is archaic.

KEL: In what respect are they "off the track"?

RD: By not recognising the zoological facts. In your thinking, where does the nervous system, ~~bas~~ such, begin? What creatures had the the first nervous system?

KEL: Well, in our teaching we went back to Amphioxus in the vertebrates.

RD: Amphioxus, that is a creature to go back to, but no body has gone far enough - to the coelenterates for example, the things that " " like this - that is the sympathetic nervous system. That is the nerve net. It is everything in our bodies - in our muscles.

One of these papers is my description, assisted as I was at that time by Kolzinski, who was the only member of the Czar's family to escape from Russia. He didn't believe what I believed - that is in the double origin of double innervation of the striated muscles of the python. I took the python as a typical pre-mamalian creature. This is exactly what MacLean is talking about.

KEL: That is MacLean's "triune brain"

RD: And of course, no neurologist can accept that, because of Hiss and Virchow, both of whom were anti-Darwin. It took them 40 years to recognise Australopithecus - at least I was invited there to come over and talk to people.

KEL: I can see now what the argument is. If you go back to the pre-vertebrates it is a different thing, the worms and coelenterates. Their nervous system evolved from a nerve net, they did not have a neural tube did they?

RD: No that is the whole point. How could a neural tube serve as origin for anything? It was only a linking -up mechanism. So all of that is 'tommy rot' from the point of view of evolution. The Hiss-Virchow people don't even deal with it.

Kel: This is all fascinating. How would you re-design what Papez is dealing with in terms of your concept? Papez interests me particularly because of his commitment to the idea that the mental process and brain and emotion are one continuum, which I think Sherrington deviated from. Sherrington made it a dualist formulation.

RD: Yes, one of my papers was a direct denial of Sherrington's view.

KEL: You would not disagree with Papez conclusion that mind and emotion are built into the brain structure.

RD: No. But if you have an erroneous conception about the evolution of the nervous system, not seeing its development from a network to its increasing precisions, how can you understand it?

KEL: I understand what you are saying. That the tubal structure is simply a drawing together differing network.

RD: Precisely. Unfortunately for neurology that is not the way it was defined. I had to build up a reputation before I could say much about this. It came about in a most unusual way. I was literally "chucked" from the coelenterates to mankind. Read the titles of some of those papers and you will see what I mean.

KEL: "A contribution to the morphology of the corpus structure."

RD: Yes, that was 1920, Elliott Smith had been writing about the Scopus Structure.

KEL: You worked with Elliott Smith?

RD: Yes, I was his first chosen person when he went to London, I had gone over to England. I didn't graduate until 1917, so I got over there when it was closing. I spent 1918 and 1919 scanning the troops that had to be sent back to their homeland from all over the world. And ultimately I was free. Elliott Smith had been in Manchester and was offered the chair of Anatomy in University College, London. And then I was his first assistant, his first apprentice.

6

The following year I came to America with a man named Shellsbear- his name is in the papers. We both agreed about these things. We came over as the first two Fellows of the Rockefeller Foundation. I spent my six months in St Louis and he spent his in Baltimore, at the Medical School- Johns Hopkins. After that, as it was arranged by Elliott Smith, we spent half of our fellowship in divergent places. After four years of disruption of everything except America, we spent three months visiting as many schools as we could, and then joined an American congress, held, I think, in Baltimore. We visited schools both here and in Canada. The final three months we used in Woods Hole to meet other scientists and do some investigations of our own. But when I got back to England, Smith had already left for Hong Kong. The following year I was with Stiksky learning more histology than I had ever learned in my life. I was despatched to South Africa where there had been a ruckus between the first professor and the Principal of the university. At that time, the only university in the continent of Africa was the one in Cairo that Elliott Smith had gone to earlier in the century, and the other was in Cape Town which had been established only a year or two before. I went to South Africa. So the next university was in the ^{the one} - that was where I was. Well, the development of education in the continent of Africa has taken place since that time. I don't know how many universities there are now, but it is a good number - even in South Africa itself.

KEL: When you were in that three months tour with Shellsbear, did you visit Cornell?

RD: Yes, we went there. But Papez we knew, though he didn't formulate the ideas you are interested in until much later. What is the next paper?

KEL: "The m of the term visceral"

RD: Aha! That is the fundamental difference. This is when the fight developed with the Americans. They use the term visceral for certain of the cranial nerves. The vagus, glossopharyngeal and presumably also the the accessory, and also the hypoglossal.

KEL: Why the accessory?

RD: Because it carries the last part of the vagus to the . Nobody knows why it is a cranial nerve when it is spinal accessory. It is differentiated from the first cranial. Th you see has only seven bones but eight segments. The early anatomizing was not puzzled about this sort of thing - They have never been understood yet. But I am hoping to explain them to you so you will understand what I at least think about it.

Kel: The term "visceral" was missused in what way?

RD: Nobody has ever addressed themselves to the question of how many segments there are - eight in the neck, twelve in the thoracic space and five in the lumber segments. Apparently the head had no segments. No-one bothered about it except that damned fool Dart. These are fundamental, but I gave voice to them as little as possible, when I went to Washington to visit MacLean and the people who work with him. To what ^{extent} I disturbed their outlook, I don't know. I subsequently sent him that paper, What is the next paper?

KEL: A note on the skulls from which endocasts were taken - the Zulodontid".

RD: Yes that is a very important paper of mine. It is one of the most primitive cretaceans. That study made me suspect that the most important pair of nerves, so far as the balance of the body is concerned, was the ^{of} ~~trigeminals~~ ^{trigeminals} - the Gassevain ganglia. The ganglia was huge and the cerebellum was bigger than the whole of the forebrain. Of course, ^{who} man thinks he has the biggest brain in the world, has one about half the size of the whale. But of course the whale dominates the sea, and is dominated by this damned fool man. (laughing). And I think that no neurologist, except myself, has been fool enough to write about this matter since we have been dominated by the idea that that the vestibular nerves are the important part of the brain- they are important. They give us our sense of balance but the nerves that created the cerebellum are the Gassenian ganglia. As a matter of fact, I was invited out last year to Sidney to address a symposium on proprioception, Posture and motion.

KEL: That sounds very interesting, - in that sequence.

RD: Unfortunately I was preparing for that when my left eye gave out, I saw a black dot at the end of my pen, so I was restricted from writing. Anyway they knew my successor, an old student of mine, Phillip Tobias. He is a brilliant man, - the person I encouraged to do for Leakey, the things that I could not possibly do when I was Dean of the Faculty as well as Professor of Anatomy. He became a great friend of the Leakey family and described all the bones and skulls and things Leakey found. And now you have probably heard about the man who has been finding Australopithecus up in the north, - Johanson. I know him very well, he has realized that the creature is either more primitive and its closest relationship is with Australopithecuses. It is like the ~~pygmaea~~ in a way. He doesn't mention this, but the pym and Europeans are different forms of mankind so his- Australopithecus, as he calls it, Austro.... after after the people in the area in which it was found. And there he has a whole community which was swept out and not been able to go back.

7

because of the insurrections and unrest and the Russian interference I suspect. Just what will happen I do not know but he has published his book Lucy. I don't know whether you know about it.

KEL: How do you build the mechanisms for emotion into this system of nervous system organization? What is the structural basis?

RD: Well that is a sideline. Emotion is a sideline with mankind. Go ahead with that reading.

KEL: "The anterior end of the ^{ural} nerve tube" -now you use that designation which I thought you found objectionable.

RD: Well the anterior end of the ^{neural} tube and the anterior end of the body- Fortunately I have a copy of that paper and will give it to you. It is sheer luck that it is here rather than in Africa. What is your idea of the anterior end of the body?

KEL: Well, I can see your emphasis on the trigeminal nerve now. It is the leading sensor for the body - the exploring end.

RD: It is, you are quite right, but as far as the anterior end of the body is concerned- it is represented in us by these canals that you run out to the ears- the eustachian tubes. The trigeminals are important- tremendously important, but we will deal with that separately. This paper will tell you, but nobody has taken the slightest notice of this paper, but the ^{was not} authorities quoted and so forth.

KEL: Perhaps much like Papez. He wrote the paper on emotion and nobody paid any attention to it. It was completely neglected.

RD: ^{of course,} I don't know ^{whether} if he quoted me.

KEL: Well, he did not. That is what Paul MacLean was interested in. That is one of ~~the~~ reasons he wanted to come and talk with you.

RD: Well you must remember the situation and so must Paul if he wants his ideas to be accepted. I am a 'bastard'- don't you follow?

KEL: Well, I think most important people are , in their own time.

RD: There are only two choices- you have to accept what people tell you, or what they say, or believe what you have found out for yourself. That is all. Have you read the biography of Darwin? You have no right to talk about scientists unless you have read it, Darwin is a fantastic figure. The story that man tells. The man who ^{if} wrote it is ^{divine} Irvine. We will ask my wife - she has a good memory, Mine has been affected by what has happened to my eyes . You should read it.

KEL: That is interesting. I think Darwin could take his position more easily because he wasn't already programmed with the orthodox assumptions and dogma of his time, he was an observer.

RD: Yes, he was going to be a parson. He learned certain things at Cambridge Then went to Edinburgh to see if he ought to be a doctor. All this happened so easily in his life that he couldn't make up his mind. But he was interested in things and wanted to travel. It was the first time that a real investigator had done that. The story of his life is fascinating.

KEL: I wonder, philosophically, whether the people that are ready to commit themselves to what they observe, as Darwin did, are people who have not been so heavily indoctrinated early in their careers. Perhaps that was true of you too.

RD: Well I wasn't indoctrinated. I got a scholarship. I think I was 16th or 17th out of twenty that were offered to students entering the first year of the University of Queensland, in the first year of its existence. they didn't even know who would be teaching. I wanted to get away to be a doctor, I was going to be a missionary. In any case I wanted to go to a respectable university in Sidney or in Brisbane. In Queensland they were only going to have engineering, science and arts. I wasn't interested in science. I was a farmer's son. I was interested in animals and people. However, my father found out that if I got through the first year in science there, Sidney would recognise it. So they sent me against my will to this ne university. But my father had more sense, of course and went down and enquired into things and discovered that Sidney would accept credits from Queensland. By the end of the year, when I had had the experience of being in the university and finding out how divided ^{things} were between science, engineering and the arts, I began wondering what am I doing? I was the first in our family of nine children to get to a university. My father was pleased and said, get on with medicine as fast as you like now. We passed through a terrible drought in 1902, the worst in Australia's history. So what happened? I said "Dad, I think I will stay right there". He said, "My goodness, what is the use of a brain to you?" He said, "I can help you now". I said, "No I can stay there and learn to be a teacher". He got the shock of his life, as I knew he would. I had protested so much and then ^{and} was prepared to stay there. So I did. When I got my degree, I went to Sidney, it was 1914. The war started in August. That happened to be the year that the British Association for the Advancement of Science went out by steamboat to Australia, to hold its meetings in Melbourne, Brisbane and

Sidney and I think Queensland which had started in 1911. It was these three years that it took me to get my BSc.. One day the chief laboratory assistant came to me and asked if I would be prepared to Dr. S.A' Smith and have time with my studies. Dr. Smith happened to be a brother of Elliott Smith. I didn't know it at that time. I said that depended on what I can do and what he wants done. He said, "Well, he is preparing a paper for a meeting of the British Association for the Advancement of Science on the bones of the South Sea Islanders. I had to ask him what was the B,A.A.S. and so forth. Anyway I helped this man with the material for the paper. And so I did. And my professor of anatomy would sometimes drop by the laboratory on his way home. He was curious about the fact that the South Sea Islanders had always been squatting rather than sitting for generations -"Do they have squatting facets on their bones?" Anyway I must have done the work sufficiently to the satisfaction of Dr. Smith to be allowed to come to the meetings.

(Ed: There is a long detailed recollection of the experience^s in 1914 at Sidney and the contact through the brother with Elliott Smith. Dart's interest in ostology^e, the changes due to manpower^{shortage} started from the war, etc.. Dr. Dart became a demonstrator in anatomy at Sidney, etc...The following discussion then begins:

RD: These are the experiences that are responsible for my being deeply interested in the neural tube and the area posteria.

KEL: The area posterior has an interesting connection with the voluntary and visceral neurons system. It is a sort of interface between them.

RD: Of course it is very important. Some of it was referred to in a paer written when I came here. It leads to something that has never been inquired into. This paper deals with the anterior end of the neural tube^{and} & shows that that anterior end of the structure is the hypothalamus and that the anterior end of the body is the oral plate. There we will have to deal with the separate structure which I had not considered at that stage

We know that there are twelve pairs of intracranial nerves, this is where the trouble with the designation "visceral" arises But we have never considere how many segments there are in brain. There are eight segments, four in the anterior part and four in the posterior part. Like the cervical segments but very much modified. Half of them are down in the tummy, but that is only in mammals, not reptiles and so on. These are modifications in this pattern throughout the vertebrates. But the thing that is important is that there are only eight segments ~~but very much modified~~

That is due to the fact that the somites of the body are the sources of not only the ganglia but also the motor cells. The first paper was written to show that that these components have an external origin.

7 The curious thing about people is that they can retain impossible notions. They realize that the gut is run by the ^{Symp?} nervous system. How can you get the SNS to manage the vessels of the brain if they were not external structures originally? That is the importance of the paper on the neuroblasts. This was something Shellsbear and I agreed upon, but it was difficult to work on since he went to Hong Kong and I went to South Africa. We were separated and I became ^{absorbed} alone in fossils- and the segments.

KEL: What position do you think of Cannon in? He was much involved in the sympathetic nervous system.

RD: We talked with him. We visited him. Cannon knew we were right, but he was the only one that did. If there were any followers of Cannon that were really interested in segmentation. But, of course, at that time I did not know about the segments in the head. What I ^{objected} to them was the application of the term visceral to segmental nerves. If you think of the nerves of the brain, the first pair is oculomotor but there are two vital sensory organs in front of that- the nose, which did not want any muscles. Even the ganglion is pulled out of the end of the neural tube, so it is anonomous. And the other is the eye, it wanted all the movements so it took over these of the olfactory and its own segment. It could either lift or flex dorsal ^{initial} flexor_x.

Now these facts, which are essential to real understanding of the brain I have never put before in my writing. I was in the process of doing it when I was planning to go to Australia. These experiences are responsible for my heresy so far as science is concerned.

RD:

KEL: Why was Cannon left in limbo, and Pavlov? They were great men doing good work ^{but} the trouble was that they were working with the S.N.S.

You see the trouble with the eye- it was greedy, it picked up everything.

?? The paper that dealt with the caetacians- no neurologist has ever read. What has that to do with segments of the brain? Smell and sight could function without disturbing anything but the animal needed something to chew on- dorsal extension ventral flexion, the trigeminal is the third segment. It was so busy doing sensory work that it didn't mind sacrificing a bit of the trochlear muscle to give the eye a tilt. Its sensory part goes right to the front- to the oral plate.

The thing that has ^{been} thought to be important in the cerebellum is its balancing organ

That is important but the organ from which it receives its impressions is the ear drum. What is the nerve supply of the ear drum? The trigeminal. There is a little segment of vagus also to the Salival canal.

They call that the Alderman's nerve. It straightens you out if you want to drink some more. The vagus does this for very important purposes. If you scratch behind your ear you are ready for some more food and drink. The important function for the vertebrates is not only chewing - but sucking - and that is where the facial comes in as the fourth adaptable segment. People have never realized that the other component of the facial is not the fourth but the sixth nerve, which lets the eyes out laterally, the abductens.

So there you have the anterior four segments

Nobody disputes the posterior part of the brain is four muscular segments so far as the hypoglossal is concerned. The dorsal muscle migrated from the back to the front providing opportunity for closing in the head. On the second and third cervials. But nobody has realized the simple care that the trigeminal which I thought were reasonable for the cetacean cerebellum being so masive, it has done the work of eight, in fact, nine segments. There is no first cervical nerve that gets to the skin. That is all done by the trigeminal is the conductor. That is why the trigeminal is the conductor of the of the sensory skin of the entire body by means of its anterior spinocerebellar and its posterior spinocerebellar in mankind. That has been shown very dramatically by that picture - that is Crosby. But its significance has been appreciated by Raymond Dart.

KEL: That is a fascinating homunculus.

RD: What I am telling you I haven't told MacLean- not half of what I have told you. So what your mission is in life, I don't know. Are you going to give a lecture? To whom?

KEL: I am only interested in collecting information relevant to Papez. I can't see you because of Paul's interest in your views and interaction with Papez

RD: Well Papez was interested in emotion- that is why he was working amongst these people when he left the University. But I think what he got on emotion was gathered from my papers. Read the titles and I will tell you.

KEL: There is one on the law of filtration

RD: That is important. You must understand that my ideas in regard to the nervous system have been progressing. They have not been static. I did not realize the importance of the gassenian in the cerebellum because all my life people have talked about the importance of balance and coordination. But how can it function if it does not receive the information? How can it? What is man? I have been learning a lot since I had to become bilateral to see as well as I do. For the past few months I have been developing both sides of my body. The perfect man as far as this concerned is only one. Look them up in the encyclopedia, BLONDIN

KEL: Yes.

RD: Readit, Blondin

KEL:: Charles Blondin, real name Jean François Rabelais, a French tightrope walker and acrobat born in Saint Au Mer, 1824, died 1897 (London) trained as acrobat in Lyons , known as "Little Wonder", most celebrated for crossing Niagra Falls on a tightrope 160' above water, several times, first in 1859, blindfold, on stilts in a sack carrying a man on his back, etc. Once he cooked and ate an omelette. Last time in 1896. Crystal Palace turned summersaults above central transept 170' up.

RD: The man in Holland, I forget his name.

KEL: Aliens, Kappers.

RD! That is right, I am sorry I never had the opportunity to discuss things with Kappers as we are doing now. Also that I never had that opportunity with Herrick; we carried on correspondence for some time until he died but I didn't have the mature outlook on it then, that I have now. I am telling you things that have gradually evolved. These papers we have been discussing go back in my life - to 1920. I was busy much of that time trying to get people to believe in Australopithecus. My life from the 30's to the end of my university career was consumed with the problems arising out of that Australopithecus and the other discoveries and correlating that with what I knew about anatomy and also about implements and migrations of people. Many of my papers have not been noted at all because they were published in South Africa and there are few South African journals in other countries. I can't even get a copy of the most important paper I wrote about human relationships dealing with the Egyptian situation. I haven't included it in that list which

only deals with the neurological aspects.

KEL: Do you recall any details of your exchanges with with Herrick.

RD: Yes. Herrick you see thought visceral a very good term and I was against it. Because you see, they thought the important thing is what it did- and so it is as far as eating and chewing ~~is~~ concerned, but there are voluntary actions and swallowing, you can regurgitate, you know, a control you have over it that you don't have after it passes the pylorus. There are four segments that they call "visceral" - the glossopharyngeal and the vagus. They are the ventral ^{or} flexus parts of the same segments - the glossophagus for the front - the critical one between the mouth and the throat and the vagus for the trachea. It is really three segments - the third part is carried to it by the spinal accessory - but the vagus is distributed down to the diaphragm.

So this is where the great mess-up has taken place in neurology, primarily through Hiss, who thought that everything was derived from the neural tube instead of the salivary tract that is the supreme "collector" of all of the information. The most important pair of nerves in the body is the sensory collector - the gasserian ganglion giving it all to the ^{higher} ~~hider~~ part of the brain. But it did not come into its prime until the mammals appeared.

KEL: I was just thinking about that. None of the other cranial nerves have a descending spiral component as elaborate as the trigeminal, do they?

RD: No, therefore it took control of the whole of the skin. I have never been able to communicate that adequately. Neurology is too dominated by the erroneous view of Hiss and Virchow. They think I am talking a lot of nonsense.

KEL: Sometime the dawn will come.

RD: That is right. And perhaps that is just as well. People need time to think and to put things together. ^{*} I have had some very important experience with Wilson, with Elliott Smith, with Shellsden, with Herrick. With Herrick we were only in revolt against Hiss, we didn't realize that Virchow had played such a role. I learned that only through my anthropology - in a mysterious way, it's wonders to perform.

KEL: Your discussion with Herrick was principally around this problem of visceral and segmental.

RD: Yes, Actually in the same journal issue in which I wrote the "misuse" article, Herrick had a paper supporting "Visceral".

* I have come to my views partly by outside information but largely by experience.

But , by the time they were published, I had gone to South Africa. Had I gone on, I would have lived my academic life in neurology, but I didn't - it was in anthropology.

KEL: What your exchanges with Papez?

RD: Yes, they were entirely direct - visiting and discussing. I don't know to what extent I communicated my ideas relative to emotion and its part. It really comes later on. Read the next title.

KEL: The Dual structure of the neopallium, in 1934, Journal of Anatomy. "The law of infiltration" was before that in "Acta zoologica."

RD: Yes, that is important. Anatomists before that had thought, Elliot Smith, for example, that the neopallium did not arise until the mammals came. But we can see that it arose in the reptiles. They had a rudimentary neo-pallium - with a cognition of things the way fishes have, not developed - unless it is to some extent in the earliest of them like the shark. The Shark has a very different brain, almost neo-pallium itself and Hiss was always aware of what I wrote in relationship to the importance of the ancestral neopallium. He was an ardent student of the Journal of Comparative Neurology. But I never discussed this with him in the way I put it in these papers. I don't think these people realized the importance of the relationship or the origin. They didn't know whether to believe in Hiss or Dart.

KEL: Hiss had a bigger ^{rather} voting block than Dart.

RD: Yes. People never understood the importance of my work in neurology, at least in Great Britain. If you went there to discuss this they would say, "Where are the papers that have shown it"? I am telling you things that have never appeared in print so far as my opinions go.

KEL: You haven't had a chance to synthesize it.

RD: I would have done a good deal of it a year ago but I can synthesize more today than I could have done then. One of the most fundamental things is learning to use the other side of your body - It was most revealing to me of what we fail to do. Of course one did it to a certain extent when you were young. Although I had recommended it to these institutes - the practice of brachiation - using the two hands the two sides of the body. I never realized the importance, (until my vision dropped) of being able to turn easily. Well, I can show you.

Demonstration on the floor

I can easily do things with my right hand that I couldn't do with my left hand until I learned to roll over on the right. You will hear the creaks.

I can get up on my left knee and right foot. You can try it any time you like.

KEL: This has only come to you since the injury to your eye?

RD: Yes, in fact some of it, only this 1st week.

KEL: How did you become aware of it?

RD: Through the eyes - losing vision. And learning that one still wanted to read and do things and so forth. Look at me now - I'm using my left hand, that is the first time I have done it - the first time. (Taking off tie, unbuttoning his shirt, etc.) I am becoming facile in all of these things. I really didn't know what to say when you said you were coming. But you are the first person I have told all of this so fully, in sequence, in order to explain it to someone who had done the nervous system but perhaps had not appreciated these other points of view.

(mentions Dr. Robindale and Wilkinson in the Institute)

I am in the process of learning. (agdd 88).

P16 → I know from the earlier sequence, that the people that understood quickest — P17
 P17 → were the physiologists. They were being introduced to a consideration of the syrup, which really wasn't understood.

KEL: They saw it as a peripheral symptom. That link between the peripheral body and the brain was never really understood. The integration was never really defined. It is central to your concept really.

RD: Yes, you see my experience with Zoogldon lead me to the appreciation that the gassenan ganglia are far more important than anyone had ever appreciated. The Cassenan ganglia and the cerebellum to mammals. This was were the bridging came - having done the most advanced of the reptilians - in epoch one - ~~what~~ I was talking about the primitive neopallins. This was published in a journal no neurologist ever read. If you read that you will get some idea about what I felt at that time. That the reptiles had a neopallin and were the just creatures to have it, giving them reactions which no lower creatures possess. And I said that part of the brain is probably concerned with the emotions. But I wasn't a physiologist nor did I have time to give to it.

KEL: What part of the brain is it? Is that later the Hippocampus?

RD: Yes. It is what later becomes the limbic lobe. But I don't know whether MacLean has ever read that paper of mine. I don't know if I ever told him about Acta Zoologica, the article on the "Dual structure of the neopallin" and

It has taken me a long time to reach greater certainty of these views.

The people that understood quickest were the physiologists and they havn't looked down a mircsroscope and they got mixed up with chemistry.

MacLean came to a talk that I gave.

The reptoles had a neopallin - they have reactions which no lower creature display I said that part is something to do with emotion.

ideas

we visited Cannon

and a man

(phone)

(we terminated this curious interview)

this other paper in the Journal of anatomy in 1934. my ideas were becoming more mature and I found later that he was saying that the Libic lobe was the source of emotional reactions. What was it correlating? What were the creatures thinking? They were asking about food and getting it. Their apparatus varies considerably among the lizards, he, Paul MacLean has worked it out.

KEL: Yes. Paul MacLean has been very interested in that.

RD: It was in the Journal of Anatomy

KEL: Yes. Paul has that paper in his library. He showed it to me in December

RD: But if you really want to know you should read it yourself. When I talked with him I didn't have the Journal of Anatomy to show him, the papers were not at my side.

Of course, Papez would have been familiar with the Journal of anatomy. It didn't make any difference to them because they already knew I had disagreed with the authorities on what was visceral - even more basic, I thought there would be confusion if I wrote further about that.

KEL: I think Paul wanted to find out more from you about that 1934 paper to which Papez did not refer, though we think he must have known about it when he wrote the 1937 paper.

RD: It was Herrick who didn't see the point, he thought it was something because it was applied to the gut. Nobody has realized that these things in the brain are segmental. There were twelve areas, how could you tell which was which?

KEL: We were talking a moment ago about the connections between the visceral neurons system and the brain - and how all that was integrated. The assumption then was, that the hypothalamus was the end ganglion of the CNS- the top of the "visceral control".

RD: Certainly it is in a very primitive way. Things are elaborated then that determine the reaction of the N.S. but in an advanced way that effects the striatum to a certain extent fundamentally through claiming elaboration, things that are fundamental to the well being of the body as a whole. But the influence of the hypothalamus in the emotions has never really been dealt with. That is why I emphasize the paper on "The anterior end of the neural tube". and the anterior end of the body- the oral plate which has been expanded over and enclosed by the brain segments. To understand them you have to separate those of the front half - the trigeminal end of the facial and

THE PAPEZ MEMORABILIA - PHILADELPHIA
MAY 21st, 1981

Raymond Dart - (continued)

- R.D. - I don't know if you have ever heard of Mathius Alexander
- K.E.L. - I'm not sure - oh, yes, the Alexander Method. I know a fair amount about that.
- R.D. - Well, that is stimulated by following his technique with our Son.
- K.E.L. - Oh - isn't that interesting.
- R.D. - Yes - when he was in trouble, as a child - long before this started - but it was written after because our Son now is in his thirties.
- K.E.L. - ? - voluntary movement?
- R.D. - But I knew the double spiral arrangement of the musculature so I published a paper on that for those people who were interested in the Mathius Alexander technique. I didn't disperse them around, but I think you'll find it interesting and perhaps understand.
- K.E.L. - Oh - yes, I think so.
- R.D. - That's where I was first committed to this idea of there being only 8 segments. Now, whether I talked enough about them to make it clear to you, I don't know but this might help (hands a copy to K.E.L.). I don't think I ever gave a copy of this to Paul MacLean.
- K.E.L. - What I would be particularly interested in again is this business of the bridge between the hypothalamus and the brain and how the control of the hypothalamus is regulated above that level.

R.D. - Well this of course I don't pretend a great understanding of, in a detailed way that he may have carried on. If you're going to consider the emotions you really got to compare what are the emotions of reptiles with the emotions of early mammals and man which is the thing that human beings are most disturbed about because they understand them so poorly. You see, if we think of the influence of what we take in, in a purely segmental way, becomes distributed to the systems of the body. They are sometimes overwhelmed by the sympathetic system or by the voluntary system. Now every person who lives an intelligent life, you know, a determined life and a restricted life and is only concerned with gathering money is just going to go after that and pursue it. The same with man and his habits. With human beings we know enough about early man, modern man and the different races of man to know that that depended on what he had gotten to know and what he got to learn . He learned that some things killed him, he learned to make alcohol and that had effects on him and all the rest of it, and he knew that he was subjected - wanting to live with female every once and awhile and in the old days he just did it and finished it all and it depended on his position in the place. He was either murdered by the fellow he thought his wife had done it to or else he -----
The whole of man's character is-----wide and terrible from the sordid to the sympathy. It's a matter of personal differentiation and of course-----people know so little about their own nervous system, as I've been trying to illustrate it's only those who treat the emotions in some sort of way. Experimentally they get an idea of it but they get an idea of it without even knowing the elementary stuff that I'm telling you.

K.E.L. - Yes, but emotion in general has been taboo. The orthodox neurologists don't talk about emotion - that's psychiatry.

- R.D. - Well, that of course is what people do - they cut it out. What's the use of cutting it out?
- K.E.L. - That's ridiculous.
- R.D. - That's the point. If you can just get people to look at it sensibly they will see it - what is necessary for them is to be realistic about it. Now, his attitude is to do it experimentally and he does it. But that's not going to persuade everybody until they themselves know how they are in the hands of fate and that depends upon their understanding and that's what's wrong with the world today. They are just damned ignorant about the things that are vital.
- K.E.L. - The whole business of setting aside this idea, that there was a brain substrate for emotion, has broken up neuropsychiatry which was previously an integrated field which included emotion, behavior and brain function, movement and sensation all in one coherent piece. We broke it up - we gave emotion to psychiatry and behavior to psychology.
- R.D. - Of course, absolutely - you're quite right. But it is part and parcel of man. They know so much that he doesn't know what to do, the vast majority of them or he does nothing or he assumes certain attitudes. He is in a position to learn. He is not necessarily learning.
- K.E.L. - It is arbitrary about what is right and what is wrong.
- R.D. - Then it comes to a matter of Church. The biggest trouble with mankind at the present time - Church or no Church and they think it is to be solved by splitting up the Church into so many parts and refusing to accept the teachings of Darwin and evolution. You can go on teaching evolution till you are black in the face but they won't necessarily accept it - and that is again, an emotional block, you follow, these are fundamental emotions, what I am going to be and what I am not going to be.

K.E.L. - And yet the scientific world seems to just ignore the whole concept of

R.D. - Oh, sure - the only thing that really stirs mankind is getting into a hole about his money. That's not an individual thing any longer really, it's an international thing. It's control and whatever gives us control and now control is the amount of money you use to destroy humanity, and that's what it boils down to - it's quite simple. There is nothing complicated about it. There is nothing complicated about the emotions.

K.E.L. - How did we get off that tract?

R.D. - Well, it just depends whether man is going to be ruled ultimately by fact and how. It won't be by human choice. So where could you get more bitter relationships than in Northern Ireland? Now, if that is the example of the Christian world, the Christian world - so called - what does it teach to the Japanese and what does it teach to the Indians? Which is far more complicated. It may be that man can improve the more he gets to know about the world as a whole, and that is what has interested me a great deal.

K.E.L. - That is what you hold?

R.D. - No - I mean what is directed - one's doing? One of the things that interested me was man's earliest conceptions. Now, I think (I have written about it and people may not discover it until the year 3,000 if they look back that far). They don't believe Darwin now because he must have been a darn fool. These are just the happenings of the past. If you got 20 colleagues together and asked them - they wouldn't believe in the segmentalism even if you pointed it out.

K.E.L. - They accept a certain orthodoxy and reject everything else.

- R.D. - Of course, they are misled by the terms - now I've got here the terms - the sympathetic nervous system, vegetative system, the autonomic system, the visceral - all of these are names for the same things, but who knows what they are telling you when they use a particular term. The only thing that they know is if it is voluntary or the segmented system, but they don't know the segmented state of the brain. I've written about it and what I was going to do out there is put these things together in such a way that people would see its relationship to man. It is a clever student who was my successor to deal with the ,man and he took 150 slides and talked to them for 3 hours. I don't know exactly what he talked about but I suspect about the evidence that Africa has given on the evolution of man. But every religion wants to disprove it as fast as they can - don't you see? So you either got to be an unmissionary or supermissionary.
- K.E.L. - You give it the housekeeping seal of approval by making a religious concept rather than a scientific rational concept. You don't ask any questions anymore after it gets into the other category.
- R.D. - Yes - and then people talk about emotions but you don't know what they are talking about. Nor do they know what part of the body they are talking about - they don't know its relationship to the nervous system. All they know is whether they have had a drink or not. Well this is the state of man.
- K.E.L. - How would it be if you revived a congregation of scientists interested in Cannon and Pavlov and Dart? That would be an interesting combination because I think your are talking about the same thing.
- R.D. - I think that you have to regard emotion as something that appeared and looked at on an evolutionary line.

K.E.L. - It must have been present all the way back.

R.D. - It depends on what we call emotion, really. Are we calling it the satisfaction of appetite.

K.E.L. - Hunger and fear.

R.D. - We are not any longer analyzing things we can experiment with because God knows we have experienced since the beginning of man. One has got to understand that intelligent people - understand up to a point but they don't know what they are relying upon when they understand. They don't say, oh, but you are talking about the sympathetic nervous system - that is how the food gets through the gut, and how you pass your fluid or solid material and with it the I
from the blood stream. Now, how do I know what affected my eyes? These are the sorts of things that come and pass away, but what do we carry on into the next generation?

K.E.L. - Well, you know it may be that the emphasis on the sort of crisis of the sympathetic nervous system is difficult for people to think of it as segmental. The fact that the whole body is thrown into response rather than a selected.

R.D. - I think that I agree with that fully, people become controlled by their sympathetic nervous system or the glandular things which are of it. They try to put this that or the other thing that they discovered has an effect on the nervous system or the blood stream or what not but they don't do it with the light of understanding what the systems are.

K.E.L. - Right - right

R.D. - It would be very interesting to me as you go on how much of this you are able to communicate to other people - follow?

K.E.L. - Yes - yes.

R.D. - And I haven't attempted myself to convert people and I have begun the preparation of a good deal that I have discussed with you. When I was going out to Australia and was interested in what I would be able to do - I am glad I didn't go because I have learned so much since. These are all things that people can try out on themselves, but how much of what happens to them do they understand? It wasn't until my body was by what effect I was doing that I knew what if was having on my own vertebral column.

K.E.L. - Very interesting.

R.D. - How could I communicate that to mankind? It is an operation involving the sympathetic nervous system and my striated muscular system.

K.E.L. - Voluntary system.

R.D. - And very segment of it

K.E.L. - Yes, exactly.

R.D. - From front to back

K.E.L. - Right - that again is very interesting because if you are looking for a sort of rational way to break out of the mold you could start off with some of the Cannon, Pavlov business that has to do with the autonomic nervous system whatever you want to call it.

- R.D. - If you ever write on it, I hope somebody sooner or later will point out that when you are talking about the visceral nervous system the sympathectomy nervous system and all the variety of names, I don't know if you can read that -
- K.E.L. - Yes, I can - you have sympathetic visceral, autonomic, in voluntary, voluntary.
- R.D. - The voluntary is dependent upon the sympathetic because it is the more ancient. It involves every muscle. When you have a reaction like getting up from the floor from a new position you are trembling - when you can't breathe any longer, when you are going back until this is relaxed, you are wondering what the hell is happening to you.
- K.E.L. - Yes.
- R.D. - So, each of these is something that a person can experience but never will perhaps, like myself, will only go as far as when it becomes painful.
- K.E.L. - Suppose you pursued it, in the sense then of looking at what Cannon was doing with emotion and say well now nobody argues about the fact that fright or that sort of thing, alarm, will change your blood pressure, your heart rate etc. Nobody argues about that. Those are part of emotional reactions whether they occur in the extremes of terrible anxiety or fright or whether they occur in the normal flux of daily life. The next question that you might ask is whether the connections that link that kind of distal outflow with higher centres that have to do with thought processes.
- R.D. - This is what he is doing.
- K.E.L. - Paul?
- R.D. - Yes - and he has proven these things sort of, I don't know about his idease about the of the sympathetic nervous system -

that is prime matter - after all, the sympathetic nervous system stimulated by the glandular system so they are primary.

K.E.L. - Does the primary occur from the nervous system to the glands?

R.D. - They are interacting. This is what makes it difficult to talk about. You can't deny the eactions from one to the other - after all if a person is going to be anxious they are going to demand more and more of the anxiety drug or the anxiety specimen in yourself. That is why people become hopeless in the end to their emotions whatever they are. So, it is a cyclical situation and when you are talking about the voluntary system, you are still talking about the sympathetic nervous system in its relationship to what you have a kind of control of. Control of it is determined by your reactions, isn't it? I mean you are going to have a determination or you are going to vary in your degree of variation - then you find yourself arguing in a circle. And how many people can you get to know as sufficient of the structure of things to determine.

K.E.L. - What would be the simplest way to ask the question you can get a person to have insight more easily than by trying to give him an exposition.

R.D. - Oh, sure - do you remember I was wondering where on earth would I start with all these things. How can I explain to a person whom I have never met in my life before how this started. How much does he need to know that I am talking the truth or whether I am a liar from the beginning.

K.E.L. - You are a genius because you did it in exactly a superlative way.

R.D. - After all, from the writing it is a bit uncertain as to what to start with.

K.E.L. - You got Darwin, Virchow, Hiss and then various psydonems for the autonomic nervous system.

- R.D. - It was the only way that I knew which would show to anyone that knew the names and the people how educated mankind's views of things have been partially modified.
- K.E.L. - Right.
- R.D. - That is the state that the world is in today. They don't even know it it is best to have a socialistic world or a money controlled world. Now of course one could spend one's life talking about the growth of people's interest as I have done also. Colour - red is the great colour. All Cardinals, Popes and things like that are red.
- K.E.L. - Blood is red.
- R.D. - Yes and so is the blood of the earth - with that I have followed all over the earth because I thought I might understand a little bit through that and everyting that was red and up to a point----- interested lots of people. Man has got to understand himself and his fellows.
- K.E.L. - The bit difficulty is maybe that you don't understand some of the machingery and you sort of put it out of bounds by creating these religious fences around thinking.
- R.D. - Ah, of course - these are the great things.
- K.E.L. - If you don't understand it, the best thing to do is to exclude it.
- R.D. - Yes - but when are we going to have education which includes it?
- K.E.L. - Exactly.
- R.D. - How much is necessary to include in order to inform everybody? Now of course what has happened is that man has got to a stage in regard to Government, only in Russia can control to a certain degree know how

their people think. You must think socialistic - even the Poles have got to do it up to a point or else be destroyed. But that is the first time its been tried. Now, the rest of the world lets you think, as the rich people have decided to let you think, as industry allows you to think because now even the daily TV doesn't depend upon the truth. It depends upon the audience of their reactions and the people up at the top - whether you are a good TV or not. But when will we get these ideas transmitted over TV?

K.E.L. - And we need them because we need to understand how.

R.D. - The sooner we get a sufficient body of people to know the fundamentals of the nervous system - that is why I spent some time thinking about what I would talk to you about. I didn't go into all these things with Paul and Paul was the first one who reacted in this way to that particular speech. I gave him the speech but it was about why study the origins of man. I didn't really tell him I studied that because I wasn't able to get along with my neurological thinking. I am revealing to you my childhood - of being a professor. The childhood of professor-dom.

K.E.L. - I am trying to think again what question would be the simplest one to ask that everyone would understand that would lead you to the logic of what you are saying. Suppose you asked how an audience perceives a picture presented to them.

R.D. - I think that is too complicated. I don't know - keep it in mind. I think what is it that stirs people the most? What are the relationships and these are the things that are being discussed over the TV. Do children become difficult? Why are there so many murders in the U.S. today? Far more than there were last year - where is it going to end? You will probably find that these people are people busy trying to get food or trying to escape work. How are they going to get work if no one will give them it? What place does work play in being a normal individual? What sentiments are evoked by not getting work? These are the fundamental questions. What produces a satisfied individual? Until Society, as the

Russians do, sees that everyone is fed and looked after but not necessarily to have a population so laege that you haven't got enough food for them to live on. One of the prime functions of man is to see that everyone is in a good state of health. Then if you say yes to keep them healthy, what are you going to do with the physicians that make \$58,000/year? Have we ever thought, what is the minimum a conveniently placed person should have in order to rear a family of so and so----or what sort of family we should have? People are nowadays. After all I was born as a middle person in a family of nine. It was alright in Australia way back in the 90's of the last century and especially so when we had to face the greatest drought that Australia experienced in 1901-02. But people don't look at life in that sort of way - not in a realistic way. These are after all the fundamental questions for each individual. How he is going to live and live well.

K.E.L. - Suppose you talk about it in terms of the balance - performance and talk about this business of overloading and underloading the system so that it is normal behavior is certainly in equilibrium state which input and output are somehow balanced. If you tip this off balance in either direction you disorganize the system and it functions badly one way or another.

R.D. - I think these are all aspects of the thing. If one can get people to be familiar with their bodies it seems to me the function of neurology is to straighten this matter out and I think that the medical profession itself is hopelessly mixed on this thing. For those who are neurologists and I communicate as much as I can to my fellows. Fortunately ----- and myself have undergone this visual disturbance and understood one another in a way that I haven't been able to get anybody else so far to see. I am interested to what extent I will be able to communicate these things to the staff of this place. I haven't bothered about that. I just talked about things, but now, a very interesting thing has happened

When I was in Johannesburg - a few days before I left for here at the end of March all of the things of which I have been talking about have really systematized themselves in a way they never had - I didn't realize how tremendously important the thing about the 8 segments. I was going to link these things together that I linked since, in the way I told you, to them out in Australia, but I was in the process of learning them finally. That is why I am able to express myself in more detail to you than I have ever explained myself to anyone, and this is part of it here (pointing to some papers?)

K.E.L. - Just a few days before you left, what happened?

R.D. - Yes, but what was the question you put before me before that?

K.E.L. - This equilibrium state - is it necessary for normal function? It must be balanced?

R.D. - Yes - these are the sorts of things, ah, people are not balanced. When you compare individuals with Blondin, now, Blondin didn't need to know anything about his nervous system. He was so completely balanced that he could do what he damn well pleased, walk below the Niagara Falls on a tightrope with a wheelbarrow or man on his back whatever. He could prepare his food in the middle of the place. If it were not recorded there, but who reads it? Not anybody in America. This is to me a basic thing. I didn't know, although I knew about Mathius Alexander and I was still with Mathius Alexander when I wrote that article or interested basically in him, when I wrote that article where I showed him the 8 segments.

K.E.L. - The double spiral?

- R.D. - Yes, in the double spiral arrangement of the musculature. Man had been prepared for this by nature. He can roll over on his tummy, or head or tail. That is what made the possibility of -----But Blondin couldn't cure anybody. He learned for himself a place that the has never been able to destroy. It destroys as much as it gets.
- K.E.L. - For more space. That is great.
- R.D. - Well now this is what I am going to talk about more and more here for my own experience as well as him. I introduced bracheation, that is swinging from a ladder before and that it made so many people well that were indifferent in children. It is not merely as important as the capacity for rolling in both ways. Children now when they are taken and stimulated to learn after 3 years are so different for any other child that you got to see it in order to believe it. Your wife can come and see that as much as she likes. It is not something that we adults have discovered. It is what this daughter of -----did practically. If children can learn that and think why can't they learn this, that and the other thing? Instead of being a damn nuisance to everyone and that is what they are. To play a violin at the age of 4 or 5; speak in three languages to anybody. I tell you what happened with the children the last time we were out in California. I didn't know about it till after we came back but the children were taken out by their mothers in order to show members of the what they could do, and the children were about half a dozen. There were both Japanese and Chinese people in the audience and the children were talking in Japanese. They were understanding one another and after awhile the people were listening in - some of them got up to stand around the table to hear exactly what was happening. This is the story as it was told to me. And then before, they were simply chatting to one another, they listened and then they something in Japanese. And all these people just automatically bowed and went again.

- K.E.L. - Isn't that amazing - what a lovely story.
- R.D. - But they never expected it was going to happen nor anything of that sort. They are doing this sort of thing in Japan, Australia - taking the children and educating them. But who wants to know it? It upsets the whole education system of America. There is not a teacher who wants to know it.
- K.E.L. - That is right.
- R.D. - They were stopped for developing this technique that is here and been here for the last 12 or 13 years.
- K.E.L. - Do you write to Mr. Dillman?
- R.D. - Oh, yes - if you leave your address with me, I can hand it on to them.
- R.D. - Oh, my God (tape-----erased a few lines)
- R.D. - It arises with two men - one is Gilbe and the other is Moseson who were taking their lessons for M. Alexander teacher - Mr. Carrington in London. Now, I don't know if you know anything about M. Alexander. He was a Tasmanian who taught people the art of utilizing their body better and mostly it was done by making them rise and sit better. They have found out at two of their symposium were a man who taught them M. Alexander technique but mostly he was a medical man looking after exercises - physiotherapy. Another man was, who Carrington admired very much, who was a horseman and who learned about the Alexander technique through horsemanship and what it did for the equilibration for the two sides of the body especially the horseman's work that is done for 800 years in Vienna. He produced an article which was talked of at this same meeting that I was to have gone to. Now, just as I was about to leave Africa, again 3 or 4 days before I left this man told me these two men Gilbe and Houson had invited me and my wife to come to the biggest hotel in Johannesburg and we had dinner. I found that they had been together with Gildi's wife instructed at the M. Alexander School in London run by Carrington. But these two men were out together with this man's wife in

in order to show to business organizations how tremendously impressive it was for them to learn juggling, teaching the administrative staff of big companies to find out whether their personnel could juggle and if they couldn't to instruct them in it, and if they didn't make themselves capable in it, to dismiss them, I presume. And the same after they knew sufficiently to instruct others to instruct their workers to deal with them in the same way. They are making thousands. At this dinner, I-----this before and thought my goodness that is strange. M. Alexander and technique and so forth. I went with them and my wife to this hotel and we talked about all of these things and told them about the same things that I've been talking about to you. That is, about the understanding. The worst pair of nerves in the brain. It is the one that causes so much trouble I could never write about it when I was in the middle of struggling at that moment they have a record of not only what we discussed or what I discussed from questions they put to me but were also being photographed in the process. I haven't seen the record that they took but they took it when I was in a relatively position about some of the things I have been telling you about that have happened since the last 3 months.

K.E.L. - That is certainly recent.

R.D. - Yes, it is really just before I left there and up to this period.

K.E.L. - When was the eye event?

R.D. - The eye event was in December - in the left eye on which I was depended. The right had gone before - nearly 3 years.

K.E.L. - Of course that information goes to your right brain?

R.D. - Sure - we had all this discussion and they took the whole thing and photographed it. Since I have been over here two months they have gone back to London to Carrington. I got a letter from Carrington mentioning

these things and also about the horsemanships. It made a big contribution to him personally. I could see that when I last saw him in London. It must have been a couple of years ago. But it was very funny - I have been talking about the importance of learning juggling here and we haven't started yet. But that will be done sooner or later.

K.E.L. - That will be part of the program

R.D. - Some of them have already have known a little bit about doing things. Yes, it would be very nice for children to learn easily. Apparently, you know, the Chinese are very expert at it and a good many Japanese too. For the children, it is very ----- with rubber balls and probably your wife will be interested.

K.E.L. - I will tell her about that.

R.D. - What I wanted to tell you is this man Gilbe whose father is a medical practitioner over in the neighboring state - he went to that place. His father is a doctor of surgery, like you. With his surgical work he got into a terrible situation with his back, hopeless. He had to go to bed. His son got him up a week ago and made him learn juggling and he has been on his feet ever since. But juggling is spreading around this part of the United States.

K.E.L. - Incredible. It is a great idea because juggling is something everybody understands fairly easily.

R.D. - That is the point and yet these people do it perfectly. They tested my and my wife's degree of erectus when I was there. They kind of congratulated us as a matter of thinking it might be better, I suspect. So here is a very interesting thing - that horsemanship are ----- are bilateral work as in juggling are extremely important

and people don't know what the hell they are important for. I told you about these 40-50 people gathered around this woman down in Toulant (?) last year - they were talking about the----- right and left handiness - using all sorts of medical terms----- I was talking to my doctor about sightliness and so forth and we invited him and his wife to our flat in Johannesburg to have a dinner so we could talk about this. I told him I was interested in this about one year ago before the 2nd incident happened and how important it was the left side should be attended to----- particularly elderly people. He himself has experienced difficulties in his own life. He surprised me by saying - it's very interesting that I should have gone out with one of my patients to our work with the -----He has had something wrong with his right arm and so he had been doing it with the left and remarkably well. In fact, although he doesn't know it, as far as I know and I wasn't prepared to ask him. He has changed in his attitudes to things. He used to be terribly angry easily over various things. Now he is as placid as you can imagine. In fact his whole attitude has changed. I never dared to comment on it to him. He will find out sooner or later. Last time I was over I asked him whether he had ever discussed it with him and he said yes I had-----

(end of conversation)