



COLLOQUIUM

Palais des Académies, Rue Ducale 1, Brussels
26-27 October 1989

Fain and Society

Organized by the
Foundation Europalia International

under the auspices of the

Honda Foundation

and the

**Belgian National Fund
for Scientific Research (FNRS)**



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Edited by

C. Mangan – E. Sayers

Commission of the European Communities

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INTRODUCTION

BY

Professor P. FASELLA

INTRODUCTION

PROFESSOR P. FASELLA

The idea of a joint Japan-Europe Symposium on "Pain and Society" had a double origin:

To begin with, K.H. Narjes (Vice President of the Commission for the European Communities responsible for Science, Research and Development in the 1985-88 period) had for some time displayed a deep interest in "Pain" ('Schmerz' in German) as an inescapable component of human life, affecting individuals, society in general, and the pharmaceutical industry (the market for analgesics for pain relieve is estimated to be \$3 billion per year). He encouraged me to organize a Symposium where outstanding representatives of physiology, pharmacology, medicine, sociology, industry, and law, as well as philosophy and theology would jointly discuss various aspects of "Pain" in our society today.

The other stimulus came from conversations between Professor Okamoto and myself on our respective cultures. We agreed that deeper mutual understanding was necessary. We discussed many aspects of human life and compared our attitudes towards many of them, including pain. Our common medical background probably made both of us particularly interested and sensitive to the problem; we decided to examine it jointly, very much along the lines which Herr Narjes had indicated, but in the broader and deeper perspective afforded by the diversity of Japanese and European cultures.

"EUROPALIA JAPAN" seemed an ideal forum. Europalia has, in fact, established a tradition of original approaches to comparative cultural analysis. Our proposal was enthusiastically accepted by the Belgian and Japanese authorities responsible for organising the programme of "EUROPALIA JAPAN" namely the Europalia International Foundation under the auspices of the Honda Foundation and the Belgian National Fund for Scientific Research (FNRS). I wish to thank them here for their understanding and generous support.

The colloquium offers a wide perspective on the subject of Pain by making a comparison between Japan and Western approaches, not only by considering the scientific aspects, but also by investigating alternative therapeutical possibilities. With the wide variations in a patients response to pain, different approaches to its treatment is of great interest to all health professionals, lay people, philosophers, and theologians alike.

In conclusion the colloquium sets out to establish a fruitful dialogue between the representatives of different cultures whose perception and attitudes towards pain are sometimes widely different but have the same common goal of finding efficient methods to alleviate suffering.

A D D R E S S B Y

Mr J. GROOTHAERT

Commissioner General Europalia Japan 1989
Europalia International Foundation

ADDRESS

Mr J. GROOTHAERT

Ladies and Gentlemen,

In my capacity as Commissioner-General for Europalia Japan 89, it is my great privilege and pleasure to open this important Colloquium which is one of the many events which are taking place in the framework of this ambitious festival called Europalia Japan.

I say ambitious because as the main organisers of this event we wanted to show a very complete panorama of the most diverse aspects of Japanese culture in the broadest sense of the word. We believe it is time that Europeans obtained a closer understanding of the traditions, roots and culture of Japan, one of our leading industrial partners.

We perceive a growing curiosity and a desire, not only in Belgium, but in many European countries, to know more about Japan. In our increasingly interdependent world, we feel it is absolutely necessary that a closer co-operative relationship should be established between the present day Europe, and its trading partners and political allies in Japan and the United States of America.

For a long time, close relationships have existed between Europe and America with obvious cultural, linguistic and trading links developed by the original European settlers. Japan on the other hand is a relatively new economic and scientific world superpower, and being Asian presents obvious differences in historical, cultural, and linguistic aspects. However Japanese influence upon modern western society is becoming increasingly profound and has led to this European curiosity regarding Japan, the country, its people, and their way of life. In this respect the Europalia foundation this year focuses upon Japan by organising events particularly in the field of arts, through exhibitions, concerts, theatre productions etc. Of equal importance are conferences such as these involving meetings of minds, discussions, and confrontations, on some of the essential problems which we jointly face in the modern world today.

Europalia has organized this colloquium with the help of three main partners, the European Commission, the Japanese Honda Foundation, and the Belgian Fonds National de la Recherche Scientifique.

This is one of a number of selected symposia and colloquia organised by the Europalia foundation, e.g. "Self-organization as a new scientific paradise" which took place recently in Brussels and was presided over by one of our most distinguished Nobel prize winners, Professor Prigogine. Outside of Belgium, Europalia is deserving its name as an increasingly important European institution by organising symposia on: "the differences in Japanese and European approaches to technological innovations", which took place in Toulouse, France; on "the perception of the notion of risk in human activities in Japan and Europe", in Varese, Italy; on "the Japanese and European approaches to basic research", in Berlin, and finally on "Japanese and European approaches to the training of scientists", in Lisbon. We are indeed proud of having been able to organise these

symposia and in so doing to broaden the scope of the Europolia Japan year into scientific fields. That is why I am convinced that what we are going to witness and hear in this Symposium will be further proof of this success. The very presence of such a large number of outstanding personalities both actively participating in our meeting, and in our audience makes this certainly one of the most important events within the framework of this great organization and proof of its continuing success. That is the contribution Europolia wanted to achieve, and we are grateful to all those who have made it possible.

I would like to take this opportunity to wish you all a very successful meeting. I am sure this will be a very enriching and interesting experience and that we will learn a lot from each other. Finally, may I conclude by quoting a very distinguished Japanese scientist who once said: "Progress is made, not by eliminating differences, it comes from increasing the common elements through which we can understand and appreciate each other's views". Thank you very much.

A D D R E S S B Y

Mr T. HARATA

A Director of the Honda Foundation
Permanent Adviser to the Honda Motor Company Limited

ADDRESS

Mr T. HARATA

Distinguished Guests, Ladies, and Gentlemen,

In connection with "Europalia 89 Japan", the Honda Foundation has been honoured to support all of the six scientific colloquia held in Europe this year. Europalia is a European foundation which promotes and organises exhibitions of art and culture. Speaking on behalf of the Japanese people as a whole we are profoundly grateful for the interest shown by many Europeans in Japanese culture and the warmth and depth of feeling shown so far towards our culture and heritage during this Japanese Europalia year.

It is my wish that the mutual understanding and respect that "Europalia 89 Japan" actively promotes will enhance further the exchange of culture between Europe and Japan, and in so doing contribute in its own way to the understanding and tolerance necessary for the progress of mankind, and peace on earth.

On behalf of the Honda Foundation I would like to express our gratitude to the Europalia International Foundation to have given us the opportunity of supporting two scientific colloquia in Brussels in collaboration with the FNRS of Belgium. We are also honoured to have supported the scientific colloquia in Toulouse, Varese, Berlin and Lisbon in collaboration with the European Commission. The main object of these six Europalia colloquia are to provide discussions and debate concerning European and Japanese points of view on important problems encountered by the scientific and technological scientists in the two different cultures. In order to achieve this objective it was necessary to group representative people from both parties concerned. In this respect I would like to take this opportunity to thank the distinguished European and Japanese speakers who have kindly donated their time and expertise to present papers at each individual colloquium.

The Honda Foundation was established on the basis of personal donations made by Mr Soitro Honda, and his brother Bendro Honda of the Honda Motor Company Limited. The main objective of its activities are to contribute to the development of technology which has positive effects on the well-being and health of mankind in general from an ecological and environmental point of view. In this respect the Honda Foundation, has been organizing since 1976 symposiums based upon different scientific discoveries concerning environmental and ecological improvements to our society which have been attended by prominent academic and practising scientists representing many different countries. We have also organized symposiums between Japan and other countries to promote mutual understanding on the eco-technological benefits of scientific discovery.

Last, but not least, I would like to express my sincere thanks to the Europalia Japan 1989 organisation and to the European Commission, for making it possible for us to be here together in Brussels today.

SESSION 1

INTRODUCTION

Historical, Philosophical, Theological
and Ethical Aspects of Pain
in Japanese and Western European Cultures

PAIN AND COMPASSION

T. ASHIZU

When I see the word "pain" in front of me, the first thing that comes to my mind is physical pain like a headache, stomach ache, or the pain of a wound. Obviously "pain" also refers to mental suffering and a troubled mind, as can be seen in the Japanese expression "shintsu" meaning mental pain. At any rate, "pain" is a feeling which is unbearable for human beings, a condition of suffering from which we want to escape as soon as possible.

The theme given to this symposium, "Pain and Society", appears to be a theme that touches on the essence of pain. For instance, when my tooth aches, that pain is initially personal. It is as though the pain is going deeper and deeper into my gums and inside my body. But the pain also seems to direct me outside of myself. First, I complain to my family about my pain through words, "My tooth hurts". Not only that, this pain leads me to others, such as the dentist who is supposed to remove the pain. In this sense, even though I suffer from pain as an individual, it is something that directs me outside of myself to other people, something that intrinsically seeks "society".

On the other hand, a feeling of compassion for the suffering existence, and a strong desire to relieve such pain exists in society. Any mother will feel a pain in her heart if her child cries from pain. Having a sense of compassion not only for parents, children, and those that are close to you, but also for the suffering of fellow human beings is a natural sentiment of man, the true nature of man. There is a word in German "Mitleid" - compassion - which means "sharing the pain". Goethe once said, "Knowing my pain, I learn to be involved in the pains of others"⁽¹⁾.

Society cannot be formed by one man alone. It is a world comprised of the self and others. Pain directs me to others, and I also show compassion towards the pain of others. In these two senses, pain is something that opens up the social nature in a person.

I mentioned earlier that pain is unbearable, but where does that unbearableness arise from? Aside from the unbearableness of the pain itself, there exist the anxiety and fear that accompany pain. Pain is a warning signal of life. It is a phenomenon in which a part of the body conveys, via the nervous system to the brain, that greater danger may come if the situation is left as it is. The ultimate danger is nothing but death. A patient who has become aware of his or her incurable disease is assailed by the fear of death as the pain becomes stronger, and eventually starts to think about what happens after death. In other words, one of the unbearable aspects of death is the anxiety of actually dying, i.e. the present pain anticipating the future.

Secondly, there is a form of pain that even makes this horrible death feel like relief. In this case, the unbearable pain is in the fact that there is no end to it, that it seems to go on forever. Dostojewski talks about the "most dreadful punishment" which was inflicted upon Russian prisoners. A prisoner was told to carry a mound of earth from one place to another, and then told to put that earth back to where it came from. By giving the meaningless and never-ending repetitive work of building and breaking down the same mound over and over, even the most vicious criminal will seek escape by suicide after a short while⁽²⁾.

A criminal who has been liberated from eternal suffering by suicide is rather fortunate. If a person cannot even have the hope of death, or if he or she has to come back to this world after death and go through the same suffering again, what would happen? The torture of the inferno which has been imagined in Europe and the East since Medieval times would be the symbol of such immense pain. The inferno in Christianity is depicted in the Inferno Chapter of Dante's well known "Divine Comedy" (Dante, 1321). However, let me mention here "Ojo-yoshu" (Genshin, 985), a Buddhist scripture written by a high priest named Genshin more than three hundred years prior to the Divine Comedy. This scripture describes quite realistically the bloodcurdling scenes of torture in the inferno. In Buddhism, the inferno is referred to as the world of "ultimate suffering", and this "ultimate suffering" is the continuation of pain as a result of the ongoing repetition of life and death⁽³⁾.

At the inferno referred to as "inferno of regeneration," it is said that sinners are severely beaten by the devil's iron club until their bodies are smashed into pieces. When a cool breeze starts blowing the sinners are returned to their previous form and are smashed into pieces again. The torture goes on forever through this repetition of death and regeneration. In another inferno, sinners are hung upside down from trees and burned. But the scripture says that, "they will come to life again after they are thoroughly burned". In the deepest inferno, sinners eat their own flesh from starvation. It is also said here that, "they are born again after they are eaten up, and are eaten up again after they are born".

In Dante's "Divine Comedy", the inferno is also described as the place of "eternal torment". The scene of regeneration in which the sinners that are burnt up by the fire of the inferno and then resuscitated from the ashes in their original form is found here as well⁽⁴⁾. With regard to the concupiscence and selfishness deeply rooted in the human being, however, the form of torture in Buddhism is far more thorough and persistent. Pierce torture is destined to bring death to sinners, but for the torture to be consistent termination through death must not exist. It is for this purpose that the regeneration process of bringing the dead back to life became essential.

So far I have talked about two types of fear that accompany pain in the context of its unbearable pain. One is the fear of death, fear about the unknown future that may visit one at any time. The other is the unbearable pain of the moment, the fear that it may go on forever. The debate over the propriety of mercy killing is mostly for salvation from pain of the latter category.

Let us now take a look at how pain can be cured. Up to here, I have been discussing pain from the standpoint of the subject that feels the pain. Yet the experience of pain overlaps with the desire to escape from it, and it is therefore impossible to understand pain without looking at the aspect of its cure. The viewpoints of the cured and the curer are presented here. It is essentially the relationship between a patient and a doctor if you apply it to the world of medicine. Being a student of literature I am not qualified to discuss the medical side however I will discuss the subject from the point of view of poets and writers and their depictions of the philosophy of pain.

Goethe in a scene entitled "Comfortable Land" (Anmutige Gegend) from his famous drama, "Faust"⁽⁵⁾ describes a scene showing the leading character Faust relieved from his suffering and despair by going into a deep sleep. After being totally exhausted both mentally and physically, Faust fell asleep one night in a meadow deep in the Alps and was relieved of all the agony of his past by the natural healing power of sleep. When he awoke, he was rejuvenated in the fresh world of the morning.

Depicted in the first stage is how Faust sought sleep after total exhaustion and laid himself down in the meadow where his sleep was expressed in song by Ariel the leader of the fairies. Ariel takes pity on the miserable sleeping man and orders the fairies to bathe him in the stream of oblivion to remove the "burning pain" from his heart. The fairies start singing the natural transition of the night with their beautiful lyrics, leading Faust into deep sleep through which they relieve his pain. In a way, it is a relief through music. The fairies disappear with the dawn, and Faust wakes up.

After opening his eyes, Faust immediately starts talking to the earth that is pulsating under his feet, and a new energy fills his entire body. Joy and a will to live emanate inside his heart. He offers his sincere gratitude to Mother Earth for this miraculous cure that he has received from nature.

What was the agony that gave so much damage to Faust and emaciated him? It was the pain of lost love which is described in the famous Gretchen tragedy. Faust meets a charming girl from a town named Gretchen and they fall in love with each other. She gives her body and soul to Faust, and eventually conceives his child, but she kills her newborn baby by drowning him in a pond for fear of being an unwed mother. She was caught and arrested for infanticide, sentenced to death, and ends her life on the guillotine. The night before the execution, Faust sneaks into the jail and cries out in front of the frenzied Gretchen, "Oh! I should have never been born!" After being stricken by such grief, Faust sought sleep in the meadows of the Alps.

Kanzo Uchimura, a great Japanese Christian thinker who died in 1930, took up this scene from "Faust" and strongly criticized the author Goethe. Faust seduced an innocent girl and ruined her. How can a sinner like him be relieved of his pain through sleep and become completely oblivious of the agony he has caused without even a single repentance? There is no way that this author Goethe can enter heaven after allowing Faust to commit such an unforgivable deed. Uchimura argued that the best Goethe could do was to go to "purgatory" as described in Dante's "Divine Comedy"⁽⁶⁾.

However, this interpretation seems to be overly unilateral, to say the least, as Uchimura did not understand the symbolic expressionism found in literature. Be it sleep or oblivion, they were the symbols that were used to express the healing power of nature. As human as he was, Faust must have experienced one suffering after another and repented his deed over and over after Gretchen's death. The night that Faust slept was merely a symbolic expression of the many years that Faust had to spend before he was relieved of his pain.

Confession in front of God is a great teaching of Christianity. But what about the villains who have committed crimes that are so evil that they cannot be repented no matter how much they tried? Do not they have any hope for salvation? Natural salvation is something that should be available to all men and women until the very end, whether they are good or evil. The only way to save Faust from his tremendous fear was to drive him into suspended animation for a while and give him new life in this state. Goethe himself said that this role was played by the compassionate natural healing power as symbolized by the fairies. As expressed in the song sung by Ariel, "Give pity to those who are unfortunate, be they saints or sinners", natural compassion is an infinite force which is poured equally on all living beings, beyond the order of morality of good or evil. No matter how good the doctor is, he cannot save the patient unless there is a will to heal. The issue here is how can a whole being called nature have a will to relieve the pain of each individual existence.

Let us now explore the source of compassion that works in nature with an organism comprised from "whole and part" in mind. Thomas Mann considered illness as "separation from nature" and quoted an epigram of Friedrich Hebbel, a 19th century playwright⁽⁷⁾:

"When your finger hurts, your finger has left your body. And your body fluid starts to circulate separately inside the finger. People are like that too. Only God seems to feel the pain".

Using the analogy of an aching finger and a body, Hebbel talks about the relationship between a man in pain and God. The central idea is that just like a finger being separated from the body when it aches, man is separated from God when he is in pain. Taking this interpretation a little further, it could be said that when a finger hurts, it is not just that finger that hurts; it is the entire body that feels the pain. When a man is in pain, it is God who actually feels the pain. In other words, the whole body is feeling pain in its finger and the whole existence of God is feeling pain in His segment called man.

When I see a finger as an organ, a part that belongs to the whole referred to as the body, I am using the concept of "organism". The concept of "organism" has existed since ancient Greece. Aristotle divided the physical world into entities that have a soul and entities that do not. Moreover, he defined entities with souls as those that live with organs, an indivisible whole which is comprised from parts but cannot be divided into parts⁽⁸⁾.

However, it is necessary to expand the range of the concept "organism" to discuss the relationship between man and God from such a perspective. In the realm of natural science, for instance, Alexis Carrel has expressed a very interesting view with regard to the functions of organs in organisms. Carrel is a French physiologist who won a Nobel prize for medicine in 1912. The boundary of an organ is not in its anatomic form, but in its function. Organs are said to exist extensively at areas on which they act. According to Carrel, therefore, all organs exist at the same place at the same time because the action of each organ is affecting the entire organism⁽⁹⁾.

It seems that Carrel presented a new way of looking at an organ by seeing it as a function to interact with others, or as a force that is open to the whole, instead of seeing it as a substance. According to this view, even the function of an eye would affect the entire body. Furthermore, eyes are organs connected with not only the ears and nose, hand and foot, but with internal organs as well. Organs can be seen as a part or as an individual. The whole can be paraphrased as universe or as God. It is all right to go beyond the confines of the organism thinking. It appears that an extremely large scale view of the world will come into being by pursuing this idea that emphasizes the function of things and the interrelation between them.

Let us go back to the aching finger once again. A finger is living not only in the limited part of that finger, but in the whole of the body. That is why it is the entire body which is the owner of that finger, which feels the pain when the finger hurts. Based on the same interpretation, Hebbel must have implied the pain of God in the pain of man. Let me add another point here. A man who is feeling pain is hoping to be healed at the same time. It is because of this desire for healing that God shares the pain with His beloved man.

When I talked about going beyond the confines of the organism what I really had in mind was Eastern philosophy, particularly the world view of Buddhism. "Entities that have soul" as described by Aristotle are limited to organisms. In Buddhism, however, the distinction between organic and inorganic does not exist. The "life" as mentioned in "Buddha-nature rests in all life" implies not only human beings, animals and plants, but also the so-called inorganic matters such as mountains, rivers and rocks. In other words, all existence was regarded as "ujo", i.e. that which possesses soul. Furthermore, it is said that the most important understanding in Buddhism for attaining spiritual enlightenment is to realize the interdependent and interactive nature of these existences. This mysterious law in which matter interacts is described by the law of "engi" (pratitya-samutpāda) which means "originating from cause and chance". If God feels the pain when I am in pain, it is caused by a mysterious connection between God and myself.

Being an Oriental and a Buddhist, it is much easier for me to understand if I think of Buddha instead of God as the whole being, and rephrase "God feels the pain when a man feels the pain" to "Buddha feels the pain when a man feels the pain". It is probably because the idea lies deep in our hearts that Buddha came into being to relieve all living beings from their pain, distress and suffering. In discussing the "pain of Buddha", a thesis entitled "Pain of God and Grace of Buddha"⁽¹⁰⁾ written by Professor Yoshizo Kitamori, a Japanese philosopher, in 1984 became an extremely important guideline for me. This has been a major matter of concern for Dr. Kitamori since he released his

writing "Theology of the Pain of God" more than 40 years ago in 1946 in which he discusses the words of Jehovah, "Therefore my bowels are in pain for him" which are found in Section 20, Chapter 31 of the Book of Jeremiah in the Old Testament. Here, the love of God for a man who turned against the love of God is expressed as "pain". The pain of God is a manifestation of love, but it is a true pain. On the other hand, the "grace" of Buddha in Buddhism, which is called "karuna" in Sanskrit, seems to only signify "removing pain", that is, mercy and compassion, and does not stand for true sorrow. This doubt was answered by the interpretation of this great Buddhist scholar. By acknowledging the existence of Amida-Buddha who suffers with the people, he revealed that the "grace" of God included not only "compassion" but "sorrow". As a result, the author recalls that he became aware of the "pain" of the absolute being which is common in Christianity and Buddhism.

The pain of God in the Book of Jeremiah is said to have been caused by the ingratitude of human beings. Then what was the cause of Buddha's pain? Even if it were caused by human ingratitude, the pain must be different in nature from that of God, because, unlike the God in Christianity who was the creator and ruler of all things, Buddha is an all-inclusive whole being who has existed from the beginning of creation.

First, we need to know about Amida-Buddha who "suffers with the people". In discussing "the pain of Buddha", however, I would like to explain that recognition of human suffering had originally existed at the starting point of Buddhism.

Life is made up of four types of sufferings -- birth, aging, illness, and death. At the starting point of Buddhism there existed a fundamental question of how one gets away from these four sufferings and enters the state of nirvana where one can be free from all illusion and distress. "Birth" means the first pain in one's life. It is because people are born that they have to go through other sufferings such as aging, illness and death. Therefore in Buddhism life itself is seen as pain.

It is said that the cause of all human illusion and suffering is in concupiscence and the selfishness that exists at the root of such concupiscence (self-attachment), blocking our view and making it impossible for us to wake up to the dharma of the universe. Concupiscence is deep-rooted and is difficult to remove. Even after someone dies, he or she is born again in a different form, and concupiscence itself continues forever. Thus, based on the ancient Indian thought of samsara, it has been believed in Buddhism that the wandering soul will have to go around the six worlds of hell, hungry soul, animal, Asura, humanity, and heaven forever, by being reborn according to their concupiscence and karma. In this concept of samsara through the six worlds, a form of "the most unbearable suffering" which I pointed out previously in the context of torture in the inferno is again expressed as eternal repetition and as a vicious cycle.

The only way to free oneself from the rule of samsara, i.e. to cut oneself off from selfishness, is to realize "dharma". Dharma is the criterion for materializing the rules, the basis for proper recognition and the universal truth. The word "buddha", which is also referred to in Japanese as "hotoke", is originally a Sanskrit word meaning "the one who has realized the truth"⁽¹⁾. Sakyamuni, the historical Buddha who preached Buddhism to the world for the first time, also became a buddha by realizing dharma.

It was the law of engi that Sakyamuni emphasized the most. As I have mentioned before, "engi" is a principle in which all things exist through mutual dependence and interrelation. He taught that:

"B exists because of A, and B happens because of A. B does not exist without A, and B will disappear if A disappears".

There is not a single entity in this world that exist by itself by being completely isolated from others. For instance, I am a child to my parents but a parent to my children. Likewise, I am a disciple to my teacher and a teacher to my disciples. That is, I exist within the interrelation with various other people under various kinds of conditions, and the substance that can be called "I" does not exist anywhere. Moreover, I am changing and passing away by the minute amidst the various changes that are taking place around me. Everything is constantly changing, as Heraclitus, a Greek philosopher once said, "You cannot enter the same river twice". The fundamental mistake is in thinking that "I" exist and the same "river" exists despite all that. In other words, Buddha taught that human illusion is an attachment for substance that does not exist and that we cannot free ourselves from concupiscence unless we break through this attachment.

However, attainment of self-realization is not easy. Mahayana Buddhism originated in India and came from China to Japan where it was further developed and deepened. However, two different positions called the "Gate to the Holy Way" and the "Gate to the Pure Land" appeared. Those who chose the Gate to the Holy Way tried to attain spiritual enlightenment by their own efforts through various practices. For instance, Zen Buddhism, which is also well known in Europe, belongs to this category. Meanwhile, the people who embraced the Gate to the Pure Land were those who realized that it is absolutely impossible to attain enlightenment in this world through individual effort and that the only way to salvation is to be reborn in the Pure Land with the help of Buddha. It was no one else but Amida-Buddha who appeared in front of these people.

Amida is a combination of two Sanskrit words amitayus and amitabha meaning "infinite life" and "infinite light", respectively. Life implies compassion, and light implies wisdom. In other words, Amida-Buddha is a Buddha who is equipped with infinite compassion and infinite wisdom. Buddha himself is the embodiment of dharma, the incarnation of dharma. It does not have colours or form, and is an ether-like pure existence that cannot be described or represented. It was no one else but Amida-Buddha who took a name for the sake of the people as well as a form to appear from the world of the Absolute.

Grieving over the suffering of all living beings, Amida-Buddha built for them the Pure Land which was a land where no agony or suffering existed, when he pledged:

"If you believe in Me, wish to be born in the Pure Land and call My name, I shall certainly take you to the Pure Land".

Amida-Buddha was a Buddha who opened the Pure Land to remove human pain completely, he appeared in this world with His name and sent the name "Amida-Buddha" as the means for human beings to be reborn in the Pure Land. He was indeed the Buddha who emerged from compassion⁽¹²⁾.

Shinran was one of the greatest leaders in the history of Japanese Buddhism who had faith in this Amida-Buddha and experienced the compassion of Buddha. Born in Kyoto in 1173, Shinran embraced the teaching of the Pure Land at a young age and later became the founder of Jodo-Shinshu i.e. the true school for the Pure Land. Because of the role of religious reformer that he played during his time and the affinity in terms of his ideas with Martin Luther, he is referred to as the "Luther of Japan"⁽¹³⁾. The greatness of Shinran was that he listened to the voice of Amida-Buddha not as a high priest or a saint, but as a simple human being. Instead of practice or learning, he stressed that man can be saved by nenbutsu alone. Nenbutsu meant praying to Buddha and calling His name, and all one had to do was chant "Namu-Amidabutsu". Namu is a translation of the Sanskrit word *namas*, and therefore Namu-Amidabutsu implies "leaving everything to Amida-Buddha". When I say Namu-Amidabutsu, I say the words of Buddha, "Leave everything to Amida-Buddha".

In the book "Tan-ni-sho", Shinran confesses his faith and explains his philosophies. This book was written by his disciple Yuinen who wrote down the unforgettable words of this teacher that "remained in the bottom of his ears", and which make up 18 chapters⁽¹⁴⁾. The Land of Perfect Bliss that Amida-Buddha promises must be a world with no pain and suffering. However, this is strictly the world after death. Is the salvation of Amida-Buddha ineffective for the sufferings of this world? The answer to this fundamental question is found in the first chapter. A person already receives the salvation of Buddha when he or she believes in Amida-Buddha, when they wish to enter the Land of Perfect Bliss and have in mind a desire to chant nenbutsu. Prior to building the Land of Perfect Bliss, Amida-Buddha guaranteed that He would qualify those who chant nenbutsu to go to the Land of Perfect Bliss while they are still in this world. With a firm conviction Shinran taught that those who believe in Amida-Buddha will be illuminated by the light of the Pure Land while they are still in this world each time they chant nenbutsu and that they will be covered by the compassion of Amida-Buddha.

No matter how appealing the Pure Land is, death itself, which is the prerequisite for going to the Pure Land, is unbearable for the human being. Then, is it not good for a man to have the desire to rest on this earth for longer? Yuinen once asked a question of this nuance to Shinran. Instead of criticizing the question, the teacher said "I also had that doubt. I did not know you had the same doubt too". It is human nature to worry about death when one gets sick and to be attached to life till the very end. It was our deep concupiscence that led Amida-Buddha to have compassion and grief for human beings and gave Him the idea of saving them in the Pure Land. Thus, Shinran taught that people should feel this compassion of Buddha more deeply and become aware of the fact that they are destined to go to the Pure Land.

Finally, let me touch on the daring yet profound thoughts of Shinran mentioned in Chapter 3, "It is the wicked who are the subject of salvation". The wicked as referred to here are people whose hope of salvation through self-effort has been denied, people with the strongest concupiscence and who suffer the greatest pain as a result. The compassion of nature which is poured on both the good and the evil has been expressed in a scene in Goethe's drama "Faust". The ordinary idea in the world of religion must be that, since the evil are saved, even more so the good will be saved. However, Shinran asserts that, "How can the evil not go to the Pure Land when even the good can go there"? How can this paradox be valid? It is because Amida-Buddha appeared as a result of the grief He had for the helpless wicked.

I have discussed the compassion of Buddha through Shinran, who was the most prominent religious philosopher in Japan. It must be clear that Amida-Buddha is really the incarnation of the "pain of Buddha" and that He is a Buddha whose basis of existence rests on compassion for human suffering.

In this respect let us recall the viewpoint of the individual and the whole in relation to pain and society. Hebbel said that the body feels the pain when a finger is in pain and that God feels the pain when a human is in pain. The spirit of Amida-Buddha is in the fact that He came into being because of the sufferings that all kinds of existence go through. Hebbel said that behind the pain of an individual there is always a big Mitleid, i.e. there is a great existence that "goes through the suffering with you".

For a living being, pain is a danger signal, but it cannot be denied that death is an inevitable fate for those that live. The problem is to what extent can people overcome the fear of death and fill their life with light, when confronted with death. How can they become aware of the whole being that shares the pain with them and wishes their recovery. It is necessary for people who are in a position of relieving pain, such as doctors and men of religion, to show the example of being a "sharer of pain" before those who are in pain. What is more important, however, is the understanding that an even greater existence that "shares the pain" is behind them in the form of God and Buddha. In Buddhism, the compassion of Buddha is also referred to as "Daihi" (great compassion). Included in the meaning of the letters "hi" is "grief" and "compassion". Why is Buddha's compassion considered to be so great? It is because Buddha is involved in people's grief through compassion and He turns it into His own grief. For a suffering human being, there cannot be a greater support and relief.

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PAIN, SUFFERING AND THE PROBLEM OF EVIL Some Aporiae of Western Thought

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From the book of Genesis to the tragic work of Elie Wiesel⁽¹⁾, the problem of evil haunts Western thought. Suffered, committed or transmitted, evil always has a link with suffering.

The evil from which we suffer has its origin in many different causes or circumstances. It may be the consequence of violent action by other people against us, physical violence in torture, affective in blackmail, or symbolic in contempt, for example. It can also arise in the very heart of our most intimate being, in the wake of the progressive degradation of the organism, like any organized system, following the laws of entropy: we wear ourselves out, we grow old and die - this causes suffering. This evil further arises in the possible overturning of our natural environment: epidemics, earthquakes, floods, and drought. Whether it be of cosmic origin, linked with ageing, or the violence of man towards man, evil makes us suffer.

The most circumscribable form of suffering is pain. This is objectifiable physiologically, and in some cases it can even be fought with medication. However this measurable phenomenon does not concentrate in itself the whole range of our possible suffering. We can suffer from many other things besides toothache or an attack of rheumatism. The loss of an illusion, the absence of someone dear to us or of an ideal, a landscape with no horizon, all these can make us suffer more intensely and for longer than physical pain. Forms of suffering are plural and only an over-reduced perspective could envisage taking pain by itself into consideration. The line of demarcation between pain and suffering is not entered in deeds, it is a mere projection of our mind which makes distinctions with the hope of making the task easier. A pain, initially organic, can, if it persists, manage to plague the personality of the individual experiencing it, invade the whole field of that person's presence in the world and so turn existence into suffering. Conversely, existential suffering which initially was in not organic, such as that caused by the death of a child, can gradually and partly change into pain if it finds no other way - such as speech for instance - to reveal itself outwardly. In short, pain is in most cases the cause or symptom of suffering. A philosophical reflection on pain as the West has tried to think of it makes sense only if it broadens itself to take in the question of suffering and, through the latter, the whole of the problem of evil.

⁽¹⁾ V. Engel, "Fou de Dieu ou Dieu des fous. L'oeuvre tragique d'Elie Wiesel", Brussels, De Boeck university press, 1989.

In that respect, three main lines of interrogation appear to me to structure "Western thinking"⁽¹⁾: a theological line endeavouring to elucidate the relationship between the existence of human suffering and the goodness of an all-powerful God; an anthropological line asserting itself to pierce the intimate articulation of the flesh and spirit of man; and finally a physio-pathological line measuring up to the challenge represented to it by the therapeutical project. These three lines of interrogation seem to have appeared successively in our history but, contrary to what Auguste Comte⁽²⁾ announced, the theological age has not been superseded by the advent of philosophical thought or by the spread of what it is convenient to call the "conquests of science". These three dimensions of our questioning concerning evil co-exist today, for not one of these lines of interrogation has been able to attain its object. Certainly the failure of theology has often caused atheism, just as the misfortune of philosophy has caused scepticism; but the so-called success of the sciences has led only to the anaesthesia of man. Already revolted against God and torn within himself, Western man today finds himself solitary in a universe which has foreclosed the source of his own sense, viz: his faculty to be astonished, to question himself, and to mediate.

In the following reflections I shall successively consider the difficulties confronting, in their fight against evil, the man revolted against God, the man torn within himself and the man who is solitary in a society characterized by a scientific suffering.

1. **Onto-Theology⁽³⁾ and the Scandal of the Suffering of the Just**

In a paper which, in 1985, he read to the Faculty of Theology of Lausanne University entitled "Le mal, un défi à la philosophie et à la théologie"⁽⁴⁾, the philosopher Paul Ricoeur said: "What the problem (of evil) questions is a way of thinking subject to the demands of logical coherence, i.e. to both non-contradiction and to systematic totality" (p. 13). Actually, the major Western theologies and philosophies have failed to assert together without contradiction the following three statements: God is all-powerful; God is absolutely good; evil exists. Faced with the scandal of the just suffering, theologians

⁽¹⁾ If such thinking exists, it is rather a matter of a plurality of various movements and orientations among which I shall consider, above all, a particular assembly which it is customary to call "Judeo-Christianity" and which is itself composed of an infinite variety of traditions inter-related by a common reference to biblical literature and more especially to the Pentateuch.

⁽²⁾ Auguste Comte, "Catéchisme positiviste", introduction and notes by Pierre Arnaud, Paris. Garnier-Flammarion coll., 1966.

⁽³⁾ "Onto-theology: speech joining terms taken from religious speech, essentially God, and terms from metaphysics (e.g. platonic or cartesian), such as being, nothingness, prime cause, finality, infinite, finite, etc." Ricoeur, "Le mal, un défi à la philosophie et à la théologie", Geneva, Labor Fides, 1986, p. 26.

⁽⁴⁾ Ditto.

and philosophers concerned with formulating a doctrine of divinity adopt a common presumption that all suffering is deserved because it is punishment for an individual or collective fault, whether known or unknown. It is the presumption of retribution, many expressions of which are to be found in biblical literature. Although very widespread, that presumption has never been unanimous. In each era there have been great minds that have criticized it, inter alia the author of the Book of Job and Saint John the Evangelist.

After having cried to Heaven his revolt against God who overwhelms his faithful servant with all evils, Job long remains silent and then proclaims that he was entirely mistaken, that he had spoken of realities inaccessible to his science, that his complaint, however justified, was without common measure with the grandeur of God. So he remains torn apart between his revolt and his awareness of divine infinity; but he never gives way to his friends who press him to acknowledge the hidden fault which would explain his misfortunes⁽¹⁾.

And the fourth evangelist, like an echo to Job, places in the mouth of Jesus this enigmatic response to the question which his disciples asked him in the presence of a person born blind, if it was the latter or his parents who had sinned, and so he had been born blind; it is neither he nor his parents, it is so that the glory of God may be manifested⁽²⁾. It is not fitting, therefore, that the Judeo-Christian faith be enclosed in the presumption of retribution, even if it has to be recognized that most thinkers of this tradition seem to accept it.

Thus, for example, Augustine of Hippone who, contrary to the gnostics denied any substantiality of evil, could encounter the problem of evil only by borrowing from neo-platonic philosophers the perspective by which the creator and the creature can be told apart just like plenitude and deficiency. Once they can be conceived as deficient, it is understandable that creatures move away from divine plenitude and turn towards nothingness. But then the origin of that deficiency has to be realized: it is the theological theme of the fall, the original sin⁽³⁾. It was the first human fault which precipitated us into downfall. The latter is passed down from generation to generation like a blemish by the mechanism of a sort of spiritual heredity conceived on a biological model. In this moral vision of evil, the scandal of the just suffering disappears, since all suffering is either sin or punishment. The price to be paid for such a solution seems to

⁽¹⁾ Wiesel E. and Eisenberg J., "Job ou Dieu dans le tempête", Paris, ed. Fayard-Verdier, 1986.

⁽²⁾ New Testament, St. Jean, 9.

⁽³⁾ Original sin: "The Church teaches that every man, by virtue of a mysterious solidarity which binds him to the first couple from which he descends, is born in a state of downfall and guilt, caused in him by the fault of the founder of the human race. The expression "original sin" expresses that belief: it is employed to mean either the fault of our parents or the state of downfall and sin consecutive to that fault and which extends to the whole human race".

me to be excessive, for that moral vision of evil implies a penal concept of history and consequently a judicial notion of God which it would be very difficult to justify on neo-testamentary Scriptures, for Jesus himself quite rejected it⁽¹⁾.

It was Anselme of Cantorbéry who gave this legalistic theology its most finished form⁽²⁾: in effect, does not his theology of "vicarious satisfaction" find in the incarnation and death of God in Jesus Christ the only possible atonement for the fault committed by humanity against God? Only an infinite atonement could compensate for a fault which was perforce infinite, since it was committed against God, and gave him satisfaction. Only an infinite "amender" could furnish infinite satisfaction. That is why the "amender" cannot be just a man but must be an infinite vicar of humanity. God the Son dead on the cross gives God the Father "vicarious satisfaction" for the fault committed by humanity against its infinite creator. As I have already indicated, Jesus himself rejected this penal algebra when he criticized the legalism of the doctors of the Law.

Certainly the doctrine of the original sin is not without its attraction. As Paul Ricoeur remarked, "this proposal gathers a fundamental aspect of the experience of evil, namely the impotence of man faced with the demonic power of evil which is already there, before any bad initiative assignable to any deliberate intention"⁽³⁾. It is nonetheless true that the enigma of evil is thus placed in the fallacious clarity of the concept of original sin mingling two heterogeneous and even contradictory notions: those of a sin which is both transmitted by biological generation and is ascribable personally. Augustin merely shifted the difficulty by substituting the aporia of the original sin for that of the simultaneous existence of evil and a good, all-powerful God.

(1) New Testament, St. Luke 6,36; St. Mark 5,19; St. John 3,16; 16,27.

(2) St. Anselme, *Cur Deus Homo* (treatise on incarnation).

(3) Ricoeur op. cit. p. 25.

It was Leibnitz who formulated in all its splendour a theodicy⁽¹⁾ which remains "the feather in the cap of ontotheology" (P. Ricoeur)⁽²⁾. It is not in a perspective of retribution that Leibnitz tackles the problem of evil. First of all he takes into consideration not only moral evil but also suffering and death which he groups under the notion of metaphysical evil which he defines as the deficiency of any being created, if it is true that God cannot create another God but only beings who are less perfect than he is himself. Leibnitz then introduces a sort of "minimax" principle according to which, among all the worlds logically possible (and by definition all more or less imperfect), God has been able to create only the one combining the least imperfections, and the most perfections. Thus, Leibnitz considers that our world cannot but be the best of possible worlds. Our world would, therefore, have been the subject of a huge "minimax" calculation in divine understanding. The evil that we feel or observe is never anything but the consequence of the fact that the world is distinct from God and therefore imperfect. Any imperfection is, by hypothesis, largely counterbalanced by a perfection, even if the latter remains unperceived. The balance of good and evil can only be favourable in the end, since our concrete world is necessarily the best possible one.

However grandiose Leibnitzian speculation may be, it does not stand up to the cry of revolt from the just who are suffering. Men would need an optimism beyond measure to accept that their suffering is only the visible part of a world whose goodness amply compensates for its imperfections. It is not only Voltaire's Candide who pokes fun at the leibnitzian construction after the Lisbon earthquake⁽³⁾ (Voltaire, 1967), it is the conscience of any and everybody who resists this calculation which seems to challenge suffering concretely experienced by anyone of us. Neither Leibnitzian algebra nor Augustinian has ever consoled any of us in the least of our suffering. Credit must however be given to Leibnitz who perceived, in his manner, one of the mystic dimensions of the question of evil, namely that our human intelligence is insufficiently equipped to give a concrete answer, since he conceded that finite understanding cannot accede to the data of the divine grandiose calculation. However that may be, I am with Paul Ricoeur in considering that "once more it is the lamentation, the complaining of

⁽¹⁾ Theodicy: "One has the right to speak of theodicy only when:

- a) the statement of the problem of evil rests on proposals aimed at univocity; that is the case of three assertions generally considered: God is all-powerful; his goodness is infinite; evil exists;
- b) the aim of the argumentation is clearly apologetic: God is not responsible for evil;
- c) the means employed are deemed to satisfy the logic of non-contradiction and systematic totalization (...). Theodicy, in the strict sense of the term, is the feather in the cap of onto-theology". Paul Ricoeur, op.cit.p.26.

⁽²⁾ Paul Ricoeur, op. cit. p.26.

⁽³⁾ "I very humbly beg your Excellency's pardon", replied Pangloss even more politely, "for the downfall of man and malediction necessarily entered the best of possible worlds". Voltaire, "Candide, Romans et Contes", Paris, the Pléiade library, 1967, p.161.

the just who are suffering, which ruins the notion of compensation for evil by good, just as it ruined the idea of reward once before⁽¹⁾.

Emmanuel Kant recognized right away that "no comprehensible reason exists for us to know whence moral evil first came to us"⁽²⁾. No recourse for him to juridical or statistical schedules to confer on radical evil an intelligibility that would in any case be fallacious. For him, radical evil is only "the supreme maxim which serves as a subjective basis for all the bad maxims of our free will"⁽³⁾ and its "raison d'être" remains inscrutable. Of all the philosophers of Western thinking, Kant is undoubtedly the one who has best avoided transgressing the limits of knowledge, whilst not failing to recognize the problem. Theodicy comes under the heading of transcendental illusion but the question of radical evil only takes more consistency, for it is recognized that it comes within the practical sphere, where it appears as the most radical provocation to circumscribe what should not be and which action must fight with the utmost determination, under penalty of losing its rationality.

Despite Kantian lucidity, speculative thought has not disarmed when faced with the problem of evil. A remarkable witness among many others: hegelianism and its way of dialectic thinking dynamized by negativity. "Negativity" writes P. Ricoeur, with Hegel in mind, "is at all levels, what forces each figure of the mind to overturn itself into its contrary and to engender a new figure which both abolishes and preserves the precedent, according to the double meaning of hegelian Aufhebung"⁽⁴⁾. Dialectics make the tragic and the logical coincide in everything; something has to die so that something bigger can be born. In this sense, misfortune is everywhere, yet everywhere overtaken, in so far as reconciliation always prevails over tearing apart⁽⁵⁾. This dialectic "solution" of the problem of evil seems to me to proceed from the same robust optimism which already underlined leibnitzian speculation and I must admit that it does not appear to me to offer greater resistance to the cry of indignation of the just who are suffering. Here, too, I am with Paul Ricoeur when he asks "What fate is reserved for the suffering of victims in a vision of the world in which pantragism is unceasingly recuperated in panlogism?"⁽⁶⁾ Concrete, experienced suffering is always excluded from a speculative system which claims to explain evil. In short, theological and philosophical speculation,

(1) Ricoeur, op. cit. p.28.

(2) E. Kant. "La religion dans les limites de la simple raison", translated from German by J. Trullard, Paris, 1841, p.54.

(3) Ricoeur, op. cit. p.29.

(4) Aufhebung = aufgehoben: an exaltation. This neologism, invented by P.J. Labarrière and G. Jarczyk (in Hegel, "Science of logic", Vol. I, Paris, Aubier-Montaigne, 1981, p. 38) designates the same movement, peculiar to the dialectic, of "abolish-keep-raise".

(5) Ricoeur, op.cit.p.30.

(6) Ricoeur, op.cit.p.32.

when it assumes the project of a theodicy, runs up against a basic aporia of human existence: the difficulty of thinking rationally both of the existence of evil figured by the suffering of the just and the all-powerful goodness of God. Divine perfection and human suffering seem mutually to exclude themselves in the space of speculative thought. It is understandable, therefore, that a number of thinkers, more assured of the suffering of humans than of the perfection of God, have turned to atheism. However, that is not the only possible conclusion, as is evidenced by the modesty of kantian criticism. Some minds, whose audacity is equalled only by paradoxes have, in fact attempted to affront evil rather than to exhaust themselves by wanting to think about it.

Maître Eckhart is one of those who serenely teach that "suffering is the fastest steed towards perfection"⁽¹⁾; meaning by that that the suffering experienced by man is more assured of its own reality than our speculative thinking and than the categories in which it attempts to think of God. If we cannot think both of our suffering and the existence of an infinitely good and all-powerful God, it is that God does not let himself be apprehended by our categorial systems. Eckhart remarked that those who say that God is good state an absurdity as manifest as if they said the sun was black.⁽²⁾ No, he wrote, God is not good. I am good. I am better than God, for God is above the infinite negation of our finitudes. Goodness, he taught, is a cloak under which we hide God⁽³⁾. We cannot think of God and our suffering, but that in no way implies that our suffering cannot be experienced like the tearing of clothes under which we hide ourselves in clothing God with them. This theological aporia of suffering seems to me to need confronting for itself. But it comes within a cluster of aporetic convergences exploration of which needs to be continued.

2. Anthropology and the Impossible Totalization of Man

One of the other major aporiae which cross the problem of evil in Western thinking is anthropological aporia, which I shall define as follows: man seeking his identity always discovers himself already torn by the intotalizable tension which opposes the body he has to the body he is. This eminent tension grows its roots in very old problems which constitute, one side to the other, the two poles of its origin. Whether we like it or not Western thinking is inherited both from the Greeks and the Hebrews. This double inheritance constitutes both its wealth - which is immense - and its limits - which are strict. From Greece, the West has received in division an idealist dualism from which, despite repeated efforts, it has not yet been able to part. From the ancient biblical people it has inherited a profound sense of the unity of man which underlies all its protests against the disharmonies from which it suffers. Of that tension, no problem is more significant than that of the body.

⁽¹⁾ Maître Eckhart, "Oeuvres, Sermons, Traités", translated from German by P. Petit, preface by Jean-Pierre Lombard, Paris, Gallimard, 1942.

⁽²⁾ Id. p. 125.

⁽³⁾ Maître Eckhart. Id. p.127.

The radical ambiguity of the problem of the body is reflected very clearly in the opposition of being and having. Western man tries to possess, at least partly, the body he is. His body is a more or less docile instrument for him with which he dwells though without being able to leave that dwelling.

The Greek model of the body culminates in René Descartes who considers it as a machine composed of parts which together form a mechanism which is certainly complex but which is analyzable in distinct more or less autonomous parts of which the more or less good part leads to the quality of the whole. Certainly, all Greek thinkers were not dualists in the sense in which I mean this term here. Aristotle did not think like Plato or like the neo-platonics who followed him. But it is the platonic dualism which impregnates our ordinary thinking. Aristotle's perspectives have remained confined in the technical speeches of philosophers. It is a popular version of platonism which underlies our daily language. Let it so be judged.

Did not Plato write in his dialogues: "The body is a tomb"⁽¹⁾, meaning the tomb of the soul. "As long as we have our soul steeped in this bad thing (the body), we shall never sufficiently possess the object of our desire"⁽²⁾. He recommended "putting the soul as far as possible away from the body, getting it used to bringing itself back, and picking itself up, starting from each point of the body, to live as best it can ... isolated and by itself, entirely detached from the body, as if it were detached from its bonds"⁽³⁾. For the good master Aristotle, the body is finally only a contingent limitation imposed on the soul during its life in the sphere of mortals and from which it should be freed in so far as is possible so that the soul can fulfil its real vocation which is the pure contemplation of Ideas. For the philosopher, death is the supreme liberation of the soul, for bodily man carries in him a divine and eternal principle, the soul, which he must free from the material, perishable body, reducing it almost to nothing by ascetic purification. "The soul is in the body as in a prison"⁽⁴⁾. The characteristic of platonic dualism of the soul and the body is to think of two realities where other cultures, the hebrew one for instance, grasp only one. Plato, followed by Descartes, makes the body something different from man, a foreign body, one might say.

Relayed by Plotinus and Augustine, platonic dualism found a new figure in cartesian philosophy. Here again, it is not a matter of reducing cartesianism to a schematic figure; nevertheless, our daily vision of things is profoundly marked by what Sartre called "wandering cartesianism". It was indeed René Descartes and not Monsieur de la Palisse who wrote: "I considered myself firstly as having a face, hands, arms, and all this machine composed of bones and flesh, such as it appears in a corpse; I give that

(1) Plato, Gorgias, 493 a.

(2) Plato, Phedon, 66 b.

(3) Id. Phedon, 67 c.

(4) Plato, Phedon, 33 c.

machine the name of body"⁽¹⁾.

Cartesian dualism is not that of Plato. The cleavage of Ideas and the concrete gives way to opposition of the thinking thing and the far-reaching thing. The body is a machine; thought asserts itself as autonomous in regard to its bodily condition. In "I think, therefore I am", the I that thinks gives itself immediately to himself in the transparency of apperception. He has the power to free himself from his sensorial gangue. In that perspective, my body is not really me. This aspect of cartesianism is quasi transparent. Did not Descartes also write that "The body of a (living) man differs from that of a dead man like a watch that is going and the same watch when it is broken"⁽²⁾. That significant comparison may be considered as the picturesque expression of the philosophy which was both the witness and agent of the scientific revolution of the 17th century. Cartesian dualism may be criticized at leisure, yet the machine is not contemptible. It represents a systematic circuit of energy and its working obeys mathematical laws. "The body is a watch" means: a machine whose working enters right away into objective time. Once one has been able to think of it in this original way, the body has given itself to scientific investigation. Medicine and biology in particular have changed completely since they have learned to think of the human body as a clock that can be taken to pieces and put together again almost at will. These biomedical sciences have managed to construct a cybernetic model of the body which has presided over the considerable strides they have now made. Further reference will be made to this point in the third part of this paper, devoted to the objectivity of the sciences towards the human body and the subjectivity of suffering experienced. It will then be easier to measure the real repression of which the subjectivity experienced in steps made by cartesianism is the victim.

Body thinking is not thematized as such in Hebrew thinking. There are just a few touches here and there in biblical literature, in the *Psalms* and the Books of Wisdom in particular. This thinking must therefore be reconstituted from a linguistic and literary analysis of ancient Hebrew texts. That difficult but exceptionally interesting task was carried out 65 years ago by Edouard Dhorme, to whom is also owed a large part of the French translation of the Hebrew Bible published in La Pléiade. In an erudite work devoted to the study of the metaphorical use of names of parts of the body in Hebrew and Accadian⁽³⁾, the great hebraist assembled a veritable mosaic of biblical extracts which delineate quite original body thinking.

⁽¹⁾ René Descartes, "Méditations". Works and letters by Descartes. La Pléiade, Paris, Gallimard, 1952.

⁽²⁾ Id. "Les passions de l'âme". Op. cit. p. 679.

⁽³⁾ Ed. DHORME. "L'emploi métaphorique des noms de parties du corps en hébreu et en accadien". Revue biblique. Paris, 1920-23.

The two main Hebrew roots which serve as a pivot to the semantic network which conveys biblical thinking of the body are ruah and bâsar, the breath and the flesh. At first sight, this dyptic could suggest the idea of an original modality of dualism. In reality it is nothing of the sort, and if one takes the trouble not to project the Greek schema which is more familiar to us on the Hebrew lexicon, one can see the specificity and originality of the latter, which is undoubtedly to express an overall and dynamic vision of the body and not a static dualism in the manner of Plato, the Neo-Platonists or Descartes. For the Hebrew Bible a human being is inflated flesh, a carnal breath. Flesh without breath, a corpse, is a heap of dust; and breath without flesh is but a shadow. Dust and shadow are not constituents of a human being, they have no separate existence. A shadow which is no longer the shadow of something is nothing at all. Dust which is no longer the dust of something is nothing at all. Shadow and dust would not exist per se. Outside of that mutual enveloping relationship which binds them together, flesh and breath no longer exist. In that perspective, a human being lives as a dynamic and undivided universality. My body is me. A dynamic universality, the body of Hebrew thinking is structured by the space of the relationship with others. Three major axes form the pattern of this structuration: speech, action, truth and lying. The Hebrew words which designate the parts of the body are organized in a network around these three poles. The tongue, the mouth, the lips, the teeth and the ears are in the axis of the spoken word. The hands, fingers, wrists, arms, legs and feet come in the action register. The eyes, heart and kidneys are in the axis of truth and lying. None of these elements exists alone and metonymies are legion, the whole designating the part or the part the whole, depending on the contexts.

As is quite rightly noted by Claude Tresmontant in his essay on Hebrew thinking⁽¹⁾, the word "body" does not exist in Hebrew. For Hebrews the body is not that worthless thing despised by Plato and from which he wanted to separate the soul. When Hebrews wanted to speak of the living body, which God had formed in the maternal womb, the word they employed was bâsar, flesh. For them, the expression "all flesh" meant all human beings. In short, for the Greco-cartesian dualists, we have a body, whereas in Hebrew thinking we are inflated flesh, incarnate breath. It is not without interest to note that these two distinct anthropological models are linked with two very different conceptions of good and evil. For the Greeks, evil is the flesh. For the Greeks, good is freedom in regard to the carnal condition; for the Hebrews, good is when the eyes speak like the heart: the truth. The cause of man's misfortune, according to the Greeks, is the body; for the Hebrews it is lying. It can be seen that popular Christian thinking has contracted a debt much greater in regard to the Greeks than the Hebrews. A sad historical misadventure which led Christians to despise the flesh, believing that they could, without lying, live a religion of incarnation! There is an aporia in our Western culture's thinking of the body. It is impregnated with both cartesian mechanism and Hebrew dynamic globalism. These two antinomic registers are side by side in our everyday language. The first underlines the fascination asserted upon us by the successful manipulations of the body we have. The second dictates our profound resistance to having the body that we are manipulated. The pseudo distinction referred to at the beginning of this paper between pain and suffering comes within the

(1) Cl. Tresmontant. "Essai sur la pensée hébraïque", Paris, Ed. du Cerf, 1953.

perspective of this heterogeneity. Yet are not these two sources of our body thinking really articulable, however heterogeneous they be when face to face? We do not think so, for long before Freudian psychoanalysis, there were currents of thought, admittedly minority and sometimes even correctly called heretic, which considered that the real relationship between the flesh and the mind was not what it was thought to be. That is how it was that a Maître Eckhart could preach to his listeners a total detachment with regard to the body they had, with a view to its transfiguration into the body they were⁽¹⁾. It was, he said, in the coincidence in man of his inner being (the body that he is), and his outer being (the body he has) that the way is opened up to a veritable assumption of suffering experienced as a symptom of our native duality⁽²⁾. Here again, suffering is confronted head on in the work of a transfiguring detachment which knows its aim is beyond its reach but enjoys the stage along the way. It is not because complete unity is out of range that the work of unification is devoid of sense. But it is clear that such a conviction cannot see the light of day with a horizon obscured by an antimony that has remained unnamed and deemed unnamable.

In short, anthropological attempts to think through the problem of evil, suffering and pain are caught up in a pincer movement between two paradigms of the human body, seeing it respectively as an obstacle to the transparency of the soul and as intersubjective significant space. And the antinomy of these two notions seems to render any intention to articulate them on each other both hazardous and precarious. This further aporia, which I call anthropological, has in most cases been ignored, neglected or even denied. Yet it is only by meeting it face on that it is possible no longer to be its prisoner.

3. Physio-Pathology and the Denial of Speech

Biomedical sciences which underlie the whole problem of contemporary medicine consider their object along the lines of a system. They reduce the human being to the organic system which constitutes the material support thereof. According to that methodological approach, the human being and its parts are considered as isolable from their context, i.e. in particular systems with which they are in interaction. For example, the circulatory system is considered as separate, distinct, and different from the respiratory system or the nervous system. It is also considered as decomposable into sub-systems. Blood, for instance, can be considered as a system which is independent of the heart, but both interlock like the sub-systems in the respiratory system. In relation to the blood, red globules also form a sub-system. It is by methodological hypothesis that it is considered that one system is always interlocked with another and that, inversely, others come and dovetail into it. A system is also considered as evolving in time. The circulatory system develops during embryogenesis and deteriorates during ageing of the organism or certain illnesses such as arteriosclerosis or myocardial infarction. But each stage of the evolution of a system can be characterized by a state. The state of a system at a given time comprises all the available information about it

⁽¹⁾ Maître Eckhart, op.cit. p. 113.

⁽²⁾ Id. pp. 52 and 204.

at the moment in question. Measuring blood pressure or taking the pulse, for example, are elements of the state of the circulatory system of such and such an organism at such and such a time. Studying a system consists of describing it in successive moments and of attempting to formulate the laws it obeys. If the latter are correctly stated, they make it possible to foresee the evolution of the system in terms of the parameters which, at every moment, determine that state. Without those methodological hypotheses taken together it would be impossible to know how a system works.

By considering the human being as a system, biomedical sciences, and physio-pathology in particular have spared themselves the operational process with this system since, with it, they can foresee the evolution in terms of the variation of the parameters which define it. This methodological conquest, the result of cartesian dualism has proved itself to have considerable bearing which it is not my intention to disparage. However, a high price is paid for the operativity thus acquired, for it has reduced the human being to a cybernetic machine. It has taken it out of its particular history, its own subjectivity, and its actual existence.

The objectivation of the human being by biomedical sciences consists of making certain aspects of the subject incidental so as to make others more evident. Measurable time is abstracted from the duration; the geometry from the qualitative space; the entropy from the organism and the ageing of the person; the biological metabolism, from the personal existence. In short, biomedical sciences cut into human flesh to draw out of it an abstraction called a cybernetic machine. The objectivity of the observation is rendered evident at the price of making self-understanding incidental. Common determinisms are abstracted from the concrete exercising of personal liberties. In a word as in a hundred, the organism is abstracted from the person, the body that one has from the body that one is. We are recalling here a theme already encountered in the preceding discussion, but it is not just a repetition for it is so true that this resection makes it possible to encircle more accurately the ontological difference between the body we have and the body we are. Once again it is the suffering experienced which asserts its rights to speech, though scientific objectivation tends to treat that speech as a negligible quantity.

Yet speech is born of the suffering of an individual who is seeking his veritable identity in the very heart of the crisis through which he is passing, the very heart of the wound which makes him cry out. Even then, for his cry to become speech, it needs to be heard by others for what it is. Indeed, it may be wondered whether the objectivation of humans by biomedical techno-sciences is not used to a large extent to protect the carers from the cries of the cared for, for if those cries were heard they would send the carers themselves into silent cries of their own anguish, their own cries. Practitioners of objectivation, carers - by a strange turnabout of their methodology - are deemed not to suffer. That makes them deaf to the cries of those they care for, so those cries do not manage to make themselves heard. Their message is obnubilated by the expression of pain. The pain of the cared for sets in motion the technical action of the carer who is trying to relieve it. The individual being cared for is turned into an object of pain, his cry is immediately reduced to the expression of a pain which can be technically mastered. But the suffering expressed by his cry is considered implicitly as contemptible precisely because it cannot be warded off by a technical action. Yet not to hear the cry

of the sufferer as being the cry of a human being confronted with death in his desire to live, is to condemn him to silence, exclude him from the veritable conversation funding our humanity.

There are a number of ways of repressing the words that would be uttered if suffering were heard for what it is. The most effective way consists of considering that the human being is not the subject of such suffering or, a fortiori, of such speech. That is what scientism leads to⁽¹⁾. "There are only suffering bodies". That was the title Denis Vasse gave to one of his lectures⁽²⁾. Suffering is inevitable. It is in the path of life. It signs the maieutic history of humans who are, or at least should be, in turn the obstetrician and the person in confinement in the relationship which binds them together. To become a man, to become a woman, means allowing someone to confine me in a relationship which never economizes on suffering. That is why medicine, which should be the art of encountering another person's real suffering with him rather than masking it behind the technical treatment of pain and its causes, ought to be a philosophical art, a maieutic art, an intersubjective art. Suffering remains inevitable even when one attempts to reject it. But if it is denied, if it does not find in speech the expression enabling it to be met face to face, the person will unceasingly attempt, though always in vain, to recover his former health from which he is forever deprived, to restore the previous state yet it is irremediable of the past, to have once again the time that is irreversibly gone. And in this illusory attempt, indefinitely repeated, he will find the complicity of medical enterprise whenever he meets a practitioner who does not hear his suffering under the expression of his pain, but also he leads a practitioner to stray from the paths of his art, each time the practitioner allows himself to be turned aside by the explicit request of his patient. The secret complicity thus established between the cared for and the carer, combining their efforts to avoid suffering, that of the cared for returning the carer to his own suffering, always ends by both of them losing speech. Everything then occurs as if the illusory wish to restore health as it is defined by the ruling social standards drained towards its achievement all the energy the speakers really need to allow their suffering to speak, to mourn their illusions and open the way to a future which still remains to be invented. The health professions and the medical profession in particular generally seem to behave as if their task was to guarantee and promote normality which, in reality, is only the condensed expression of the screen which we put up between our suffering and us in the illusory hope of not suffering. Let there be no mistake: in no way do I intend to plead for the rehabilitation of pain. Medicine has the duty to fight and overcome pain by the appropriate care. But it also owes it to itself not to hide that pain is both the symptom and the cause: suffering being a man who is going to die.

⁽¹⁾ Scientism: a term generally employed pejoratively to mean the idea by which science makes things known as they are, i.e. objectively. Concerning knowledge of the human being, scientism means the steps taken by science which reduce the individual to an object of know-how.

⁽²⁾ Colloquium "Significations de la vie", 1981-1982. Faculty of Medicine, Philosophy Unit of Biomedical Sciences.

When the human being reduces himself to the scientist image he forms of himself, he lies to himself in believing he is telling the truth. When medicine is an accomplice in that lie or, worse, cultivates it, medicine disowns its "raison d'être" and changes itself into death-dealing ideology. From that lie follows the death of the person, both of the carer and the cared for. The third aporia structuring the Western problem of evil, suffering and pain is therefore this: through the techno-scientific development that it cultivates, Western society forecloses - and consequently precipitates - that which it seeks to correct: suffering.

Revolted against a God supposedly good and all-powerful who tolerates - even causes - the suffering of the just, tormented inside himself between being and having whereas he is deemed to unify them, solitary by the anaesthesia which is supposed to facilitate the presence of others, Western man finds himself faced with suffering in a condition marked by three major aporiae. Theologically, it is difficult for him to think both of his own suffering and the all-powerful goodness of God. Philosophically, it is impossible for him to think both of his own suffering comprised as an interior tearing between being and having and his own desire for unity. Scientifically, it is inconceivable for him that the methods employed to correct his suffering actually assume suppression of it. Faced with these aporiae, what is to be thought, to be said, to be done? Once again it is with Maître Eckhart that I find a decisive suggestion: detachment⁽¹⁾. Detach ourselves. Do not let ourselves be imprisoned by the goodness of God or his all-powerfulness. Do not let ourselves be reduced to our tearing apart or to our desire for unity. Do not let ourselves be subjugated by the sorcery of our agreed words. God is not whom we think. Our unity defines us just as our tearing apart. Our speech always masks what it attempts to make clear. Such is our condition: our suffering is more assured than the goodness of God and his omnipotence; it is the tension in us between tearing apart and unity; it is truer than our poor words that try to do so. Suffering is the symptom of the work of generating life in us, and it is the assumption of insurpassable narrowness in our concepts faced with God, of our insurmountable inner tearing and the intrinsic inadequacy of our languages when faced with suffering that we learn to understand the suffering of others and to allow our own to speak, that we undertake the struggle which our dignity requires against that suffering.

The story of each one of us is that of our consents and our resistances to the work of life and death in us. Our story is written nowhere else than in the words with which we tell it. But how is one to hear the real story of his life in the inevitably illusory account that one gives? That question is undoubtedly the most formidable one of those raised by the triple aporiae referred to above. It is the most formidable for it leads straight to the heart of the most deeply concealed terrors and the most deeply buried hopes. The story of my life seeking its truth lies only in the word which devotes itself to interpreting in the ear of another who knows how to throw me from my own illusory horses by hearing, through the words that carry it, the secret suffering dwelling in this story and who, by virtue of his ear, makes that breach in me by which I am freed, little

⁽¹⁾ Maître Eckhart, op. cit. pp 22, 26, 27, 92-94, 112-113, 149-150, 174, 203, 307, etc.

by little, from my most tenacious illusions. Eventually, that deliverance will be accomplished when it is proved that it is in itself illusory and that the only thing that counts in the end is the movement of the shared word seeking its own truth. The movement of the joint and sepearate struggle without illusion against suffering, the movement that draws the outlines of our dignity.

SESSION I RAPPORTEUR'S STATEMENT

Professor G.R. DUNSTAN

It is good for us, I suppose, to realise from time to time how modern are the scientific approaches to pain and its control which we take for granted, and how few sufferers, on the world scale, can yet take advantage of them.

The two papers with which this colloquium opened suggest that speculation about the cosmic significance of pain extends more widely when the range of remedies for pain is limited. Pain which begins as a personal experience ends as a challenge to the being and nature of God. We were taken by two routes along this journey, one by Professor Ashizu, the way of the East, and one by Professor Malherbe, the way of the West.

Each route is in fact a complex of paths, and sometimes the paths meet if only to diverge again, East and West in mutual recognition on the same journey.

Professor Ashizu opened with a statement derived from our human response to pain, a statement about the social nature of man, which classical Christian philosophers and theologians, like Thomas Aquinas, took from Aristotle and entrenched in the Christian tradition of thought. Professor Ashizu also finds in both traditions notions of endless suffering, eternal torture. In the West, the witness is Dante's *Inferno*, and we could add graphic pictures of the Doom, in mediaeval glass and wall paintings which still survive in many European churches. And it is worth remembering that every time we thrill to the *Dies Irae* in Verdi's *Requiem*, we are being taking precisely into that world of Doom. In each tradition suffering is punitive, punishment. In the Buddhist tradition, the suffering is inherent in human selfishness and concupiscence, even in rebirth. Relief is obtained only by detachment, to realise dharma to escape into Nirvana.

Here I offer two comments:

First, modern Christian theology, at least in the liberal tradition most forcefully expressed by F.D. Maurice, the 19th century theologian in England, repudiates this belief in eternal punishment. We cannot believe in a God who could punish and inflict pain everlastingly, especially if that God is supremely identified with love and forgiveness.

Secondly, Professor Malherbe has shown how the idea of escape came into Christianity from Greek dualism through Neoplatonism. The body, it was held, is evil. Salvation requires a second substance, the soul, to escape from it. Now, this remedy - escape, detachment - is contrary to central Christian theology, at the heart of which is God's engagement with suffering within all the sensitive pain-experiencing capacities of the human body. This is the doctrine of the incarnation of the Son or Word of God: "VERBUM CARO FACTUM EST", the word was made flesh, *basar* of the Hebrew tradition, of which Professor Malherbe spoke. "PASSUS ET SEPULTUS EST": he suffered

death and was buried; this, followed by resurrection, is the centre of the Christian Creed.

Professor Ashizu's paper comes near to this in principle too, when he speaks of God's compassion, feeling the pain with men : "It is because of this desire for healing that God shares the pain with his beloved men". Again, "If God feels the pain when I am in pain, it is caused by a mysterious connection between man and God". Professor Ashizu rightly finds parallels with this insight in the Jewish Old Testament, and he quotes the prophet Jeremiah.

It is a merit, one among many merits, of Professor Malherbe's paper that he shows how much western philosophy and theology have been diverted from this central approach to pain - one shared by God with man - into theodicy, a fruitless attempt to justify the ways of God to men; and then into a soteriology, a doctrine of salvation expressed in legal punitive terms. He speaks in his paper of *Aporiae*, insoluble logical difficulties. The whole study shows that the difficulties are insoluble, once you attempt, without reserve, to hold together notions of a God who is all powerful and absolutely good and yet morally responsible for the evil seen to be inherent in suffering.

Insoluble difficulty is unavoidable, once the link between suffering and evil is expressed in forensic terms: pain as a punishment for sin, personal or corporate. Behind this notion are presuppositions untenable in minds which think in scientific terms about causation, like the notion that God is the direct cause of everything that happens, and that his action must have been morally directed. This belief, abandoned by theologians, dies hard in popular belief. "Why should it happen to me?", is the cry of simple men and women, when something goes badly wrong. "Someone must have caused it"; and if we cannot blame God anymore, because we rather doubt His existence, we must blame someone else. We blame the doctor, for instance, in medicine. And so in litigious societies we sue: we go to court, to make him pay.

I suggest that western theology went down that perilous road because of two commanding cultural influences. The first was the Greek notion that God is impassible: He cannot suffer, He cannot be an object, influenced by another subject. The second notion was the Roman preoccupation with law and justice, a retributive justice, not like the Hebrew "righteousness", a retributive justice which fastened on the notion of guilt. This became inherent in St. Augustine's anthropology as Professor Malherbe has expounded it. The tragedy is that this quest, this attempt to justify punitive suffering, closed western minds to that vital element into Judaean-Christian theology, of God suffering with man; so in a sense, redeeming a suffering which cannot be removed.

The key passages in the Old Testament are the Servant songs in Isaiah (and some of the Psalms), especially Isaiah, chapter 52, 13 to chapter 53, phrases like: "In all our afflictions he was afflicted". "Surely, he has borne our griefs and carried our sorrows". These words (and many others in the sequence) were quoted in the New Testament, in the Gospels, the speeches in the Acts of the Apostles and in the epistles of Peter and Paul, quoted with reference to Jesus. The words were used to articulate the belief of the early Church that Jesus had in his obedient life, even to the point of suffering crucifixion, embodied in his own body that divine engagement with suffering, that

identification with suffering humanity, which Professor Ashizu exemplified from his Japanese tradition.

At all events there is a common conclusion. There is warrant both in the Divine Nature and in the nature of man for the exercise of compassion.

Professor Ashizu asks that doctors so embody this as to share the suffering of their patients. Professor Malherbe, with some echo from the floor, draws a picture of our culture in which Cartesian reductionism and mechanism so possess the medical mind that the doctor protects himself from suffering, by administering analgaesics to their patients or handing them on to someone else. I report this without supporting it.

My own acquaintance with doctors inclines me strongly to Professor Ashizu's view, as written in his paper. But I would not wish upon doctors such an involvement in their patients' suffering as to cripple their capacity for detachment in diagnosis, prognosis and treatment. They might be less effective doctors and nurses if they became too emotionally involved in their patients' sufferings. That thought must lead us on to the next stage of the colloquium; "The scientific and medical approaches to pain".

Professor Malherbe left us with a question: "How can medicine serve suffering human flesh without destroying the articulate person?" To that question, Mr Chairman, we must address ourselves.

S E S S I O N 2

THE SCIENTIFIC APPROACH : A SURVEY

**Fundamentals
Pain and Medicine**

Fundamentals

PAIN MANAGEMENT FOR TERMINAL CANCER PATIENTS

Professor T. MIZUGUCHI

Cancer patients suffer very severe pain which can last from a few months to several years. Both patient and family would naturally like to see such suffering alleviated because if the medical care personnel are slow in coming up with any pain management measures, or if the appropriate treatment is not being carried out, the patient cannot lead a normal life.

Here in Japan, a questionnaire survey on cancer related pain in 18 medical facilities, including the national Cancer Centre Hospital, was carried out by us in 1986. The results indicated that out of total of 4,418 patients, 1,426 were reported to be suffering from pain (32.3%), and for patients in the terminal stage, 378 patients or 68.9% were reported to suffer some degree of pain. Pain killers were found to be effective in 37.8% of terminal cases, while in 8.7% of the cases, patients die without any of their pain being eased by drugs. As for the use of different types of pain killers, non-steroid type anti-inflammatory drugs comprised 50%, while non-narcotic pain killers accounted for 31.9%.

The effectiveness of these types of drugs is on average about 50%. However, oral administration of narcotic type drugs is used in 10% of cases which has a 40% pain relieving efficiency.

It can therefore be said that the reason for the large incidence of pain and suffering in cancer patients is mainly due to the inadequate knowledge of physicians in the proper medical care of terminal cases.

Most physicians have reservations about the use of narcotic drugs for pain-killing purposes as they are concerned about their patients becoming addicted, however they are not aware of the more simple and reliable methods for managing pain in patients. Furthermore, as there is often no adequate explanation in nature for the illness and of its conditions to the patients and their family members, trust in the medical care personnel can be lost.

I now wish to refer to the following guidelines given by WHO on the management of cancer related pains:

- a) Pain killers should be taken either orally or in suppository form.
- b) Pain killers should be used in small dosages and only be increased gradually until the pain disappears.
- c) Pain killers should be given to the patients for a definite period of time.
- d) If the pain killers in the appropriate dosage prescribed to the patient fails, a stronger drug should be used instead.
- e) Should narcotic drugs be used, the dosage should be determined according to the degree of pain involved.

- f) Medical practitioners should possess sufficient knowledge regarding the side effects from the drug used and deal with the same appropriately.
- g) Medical care personnel should visit their patient at frequent intervals and confirm the extent of effectiveness of the pain killers involved.

Terminal stage patients suffer unbearable pains which often strike without warning. Gradually, as an increase in the amount of pain killers used on such a patient does not bring about any improvement and if at the same time the appropriate pain management measures are not taken, the patient becomes afflicted with emotions such as, anxiety, irritation, foul mood, regression, despair, and depression. In order to understand and appreciate the emotional responses and feelings of patients under pain killers so as to provide them with better care, medical care personnel ought to be fully aware of the psychological needs of the patients.

To illustrate the importance of pain management measures, we have undertaken a psychological test on 147 terminal-stage patients using both the sentence completion method and the Baum method.

With the sentence-completion method, we provided the patient with a stimulus phrase who in turn was asked to supply us a supplementary word or words to complete one sentence, for example, we began with the phrase "pain is ..."

Out of the sample of patients in our test, the largest group, 92 persons (62.3% gave subjective answers such as "... is hard" and "... is unbearable". 31 patients (21% gave objective answers such as "half of the pain is physical and the other half is mental" and "while the physical pain is bearable, the mental pain is not tolerable". The remaining 24 patients (16.3% gave no direct response. Most of them said "it is just difficult to repress".

These subjective types of responses are mostly given by the younger strata of patients and particularly by patients suffering from colon-rectal cancer, pancreatic cancer, and generally cancers that cause uncontrollable pains.

The objective types of response, on the other hand, are given by patients from different age groups and more frequently by those who suffer from lung cancer and leukaemia.

Finally indirect responses are mostly given by those patients who suffer from osteosarcoma.

Coming to the Baum test sample patients are requested to draw a tree based upon their image of their pain. The group of patients who drew solidly grown and strong trees is classified as 'A' while the group who drew infantile and weak trees is classified as 'B', those in-between are classified as 'C'. We made the following observations when the two tests were used jointly.

We started off the sample patients with a phrase "my family members and ... me". Most patients from group 'A' came up with responses such as "They take good care of me", "I am thankful", etc. Most patients from group 'B', however, gave neutral responses such as "I am not sure about the support of my family members".

In another case, we tried with the phrase "No matter what, I ...". Those patients from group 'B' gave responses to express their desire to live, such as "...I want to live anyhow", etc. On the other hand, patients from group 'A' show no will to recover or to return to normal social life. In addition to this, depending on the degree of pain suffered from the cancer, psychological behaviour of terminal-stage cancer patients can change. The psychological tests described above can go some way towards understanding these changes.

The present state of treatment of cancer related pains in our country is certainly far from satisfactory. We, as medical practitioners, should look at this problem of pain from the patients standpoint and treat such problem as our own.

As cancer deteriorates, many related symptoms arise. Thus, should we succeed in the treatment of cancer pain, not only do the patients themselves feel happier, as they are able to live as normal persons, their family members became more united. Furthermore, we envisage that the expressions in psychological test show a discovery of new energy in terminal patients.

The objective of pain-management for cancer patients is to free the patients from the agony of pain. From this perspective, we would like to look forward to wider prospects for pain reduction and pain elimination measures.

MULTIPLICITY OF OPIOID SYSTEMS

Some Implications for Pain Therapy

Professor Dr A. HERZ

The identification of endogenous opioid peptides and specific opioid receptors marked the beginning of a new era of opioid research. Since that time, novel and also unexpected insights into the role of opioids in many body functions have been obtained. In the present paper some aspects of opioidergic pain modulation at various levels of the neuraxis and possible implications for pain therapy shall be discussed.

Multiple Opioid Systems

On the basis of their derivation from three distinct high-molecular weight precursor molecules and respective genes three families of endogenous opioid peptides may be distinguished: Pro-opiomelanocortin (POMC), the precursor of β -endorphin (β -EP) (and several non-opioid peptides such as ACTH); Pro-enkephalin (PENK), the precursor of methionine-enkephalin (ME), leucine-enkephalin (LE) and a series of larger peptides bearing the enkephalin sequence at the N-terminus; finally Pro-dynorphin (PDYN), the source of dynorphin (DYN), and several related peptides. In detail, the multiplicity of opioid peptides released from these precursors is bewilderingly complex. Nevertheless in the present discussion it is sufficient to concentrate on β -EP, ME and DYN, as major representatives of the three important opioid peptide families.

In the last decade, an abundance of evidence for the existence of several types of opioid receptors has accumulated. The differentiation between μ -, δ - and κ -receptors, is generally accepted; the existence of further types such as the ϵ - and λ -receptor is controversial. Furthermore, there is evidence suggesting the occurrence of opioid receptor subtypes, e.g. μ_1 and μ_2 . Such multiplicity has raised questions regarding the relationship between the various opioids (peptides as well as alkaloids) and receptor types. Morphine exhibits a high affinity and selectivity for the μ -receptor. This is also true for most of the other clinically used opioids with alkaloid structure, such as methadone, pethidine, fentanyl etc. In contrast no endogenous opioid peptide is known that exhibits a high selectivity for this receptor type. Recently opioid alkaloids - morphinans - preferring μ -receptors have been detected in mammalian brain. But the amounts present are very small and raise doubts as to whether they may have a functional significance.) The enkephalins exhibit some selectivity for δ -receptors (but are also active at μ -receptors) and are considered as possible endogenous ligands of this receptor type. The dynorphin-like peptides exhibit a considerable degree of selectivity for the κ -receptor. Several synthetic compounds with alkaloid structure and high selectivity for this receptor type, e.g. U50,488 H, are available. Presently it is not clear whether the ϵ -receptor is present in the central nervous system and has functional significance there.

Sites of Opioidergic Pain Modulation

There are two main sites in the CNS at which opioids may act when modulating nociceptive responses: the brain stem, in particular the periaqueductal grey region (PAG) and the dorsal horn of the spinal cord. In addition, there is increasing evidence that opioids can also modulate nociception at peripheral nerve endings in inflamed tissue. Relevant questions to be discussed in this context are which opioid receptor(s), which opioid peptide(s) and, finally, which endogenous mechanism(s) operate in the modulation of pain at these various sites. (The term nociception is used instead of pain in the case of animal experiments in the following discussion.)

Modulation of Nociception at the Cerebral Level

Antinociceptive effects comparable to those obtained by systemic application of morphine are obtained by intracerebroventricular (icv) injection of β -EP and some long-chain peptides derived from PENK. In contrast, metabolically stable analogs of enkephalin and dynorphin-like peptides are less effective, indicating that μ -opioid receptors are of particular significance for pain modulation at cerebral level. Many data show that periventricular brain stem areas are important sites for these antinociceptive effects; thus microinjection of low doses of morphine and of β -EP into the PAG is highly effective. Descending control, inhibiting nociceptive transmission at the spinal level becomes activated from these sites. The Raphé-system may represent a link in these apparently multiple descending pathways.

Stimulus-produced Antinociception (SPA)

It is well established that electrical stimulation of the brain stem elicits antinociception in animals (in man such data are somewhat controversial). Depending on the experimental conditions, e.g. particular site of stimulation, opioidergic mechanisms contribute largely to the effect as can be concluded from its reversibility by naloxone. Which particular peptide(s) is (are) responsible for midbrain SPA and by which receptor type is it mediated? Several observations favour a possible role of β -EP: β -EP containing fibres, originating in the arcuate nucleus of the hypothalamus, terminate in the PAG region. In rats, in which the β -EP content of the forebrain and the brain stem was largely decreased by lesioning of this nucleus, SPA was much reduced, approximately to the same extent as by naloxone pretreatment. These findings indicate that electrical stimulation releases β -EP from the nerve terminals in the PAG. This suggestion is supported by the finding showing that the β -EP content of this area was considerably reduced after PAG-stimulation - while the content of ME and DYN, opioid peptides also present there, remained unchanged.

μ -, δ - as well as κ -receptors are present in the PAG region. Several observations point to an involvement of the μ -opioid receptor: morphine is highly effective when injected into the PAG. Also the fact that low doses of naloxone attenuate SPA speaks in favour of a role of μ -receptors. Further support for this assumption was obtained from experiments with continuous infusion of low doses of naloxone into the PAG which revealed a selective up-regulation of μ -opioid receptors in this region. The same conclusions were drawn from tolerance and cross-tolerance studies: repeated electrical

stimulation of the PAG largely reduced SPA; in these rats the effect of morphine was also largely reduced, while that of a selective κ -agonist (U-50,466 H) was found unchanged.

Stress-induced Antinociception and Acupuncture

Foot-shock stress and acupuncture represent other pain models which seem to involve opioidergic mechanisms. There is evidence that cerebral β -EP pools are activated by these procedures. In rats in which the hypothalamic arcuate nucleus (from which β -EP neurones originate) was lesioned, the antinociception elicited by foot-shock stress was significantly reduced. Further, microinjection of antibodies against β -EP into the PAG attenuated antinociception elicited by electroacupuncture in rabbits. While there is no indication for the participation of β -EP in the maintenance of basal nociceptive thresholds, these data indicate that an activation of cerebral pools of β -EP, including those of the PAG, may play a significant role in the antinociceptive response to stress and possibly also to acupuncture stimulation. There is no convincing evidence, however, that hypophyseal pools of β -EP released into circulation under these conditions contribute to the antinociceptive effects.

Modulation of Nociception at the Spinal Level

The dorsal horn of the spinal cord represents the first relay station for transmission of noxious input from periphery to the brain. The neuronal networks in this structure are highly sensitive to opioids and play an important role in the antinociceptive mechanisms therein. The general accessibility of these synapses from the surface of the spinal cord provides the basis for the technique of spinal analgesia, an approach which has gained increasing clinical importance in the management of acute and chronic pain. The spinal cord, in particular the substantia gelatinosa, contains many neuropeptides, including opioid peptides derived from PENK and PDYN, but not (or at most very low concentrations) β -EP, μ -, δ - and κ -opioid receptors are also concentrated in the dorsal horn.

The relevance of μ -opioid receptors in pain modulation at the spinal level is obvious from the high potency of intrathecal morphine (and of other "classical" opiates exhibiting preferential μ -opioid receptor affinity). The modulatory role of δ -opioid receptors in this respect is most convincingly documented by experiments in morphine-tolerant rats in which the antinociceptive effect of the intrathecally injected synthetic enkephalin analogue DADLE was found to be unchanged. This lack of cross-tolerance between μ - and δ -receptor ligands strongly indicated that, besides μ -receptors, δ -receptors mediate antinociception in the spinal cord.

In contrast to μ - and δ -opioid receptor-induced antinociception, the role of κ -receptors and of dynorphin-related peptides at the level of the spinal cord is still a matter of controversy. Intrathecal injection of DYN, at least at higher doses, induces flaccidity of the hindlegs rendering it difficult to differentiate between antinociception and motor incapacitation. Only weak effects were obtained when κ -receptor ligands with alkaloid structure as U-50,488 H were applied in this way. A careful analysis showed that

difficulties in the permeation of these drugs to deeper layers of the spinal cord may explain the weak effect.

Another aspect which seems to be important in this respect represents the intensity of the nociceptive stimulus applied. It turned out that at lower stimulus intensities activation of κ -opioid ligands are quite effective in inhibiting the nociceptive response, whereas at higher stimulus intensities the effect is considerably lower. Such a dependency of the relative antinociceptive effect on stimulus intensity is not seen in case of μ - and δ -opioid receptor ligands. This indicates that the spinal circuits involved in the antinociception induced by the various opioid receptor systems may be different.

Peripheral Sites of Antinociceptive Opioid Action

In recent years increasing evidence has been obtained indicating that, in contrast to the general view, opioids can also exert antinociceptive actions at peripheral nerve terminals under certain conditions. In view of the presence of opioid peptides in peripheral ganglia and nerves, such an action is not too surprising. The participation of opioid peptides in inflammatory processes has also been described. Inflammation seems to be a prerequisite for the manifestation of the antinociceptive effects of opioids at peripheral sites.

In our experiments monoarthritis was induced by injection of Freund's adjuvant into one hindpaw of rats. This results in an ipsilateral inflammation, accompanied by a decreased threshold for noxious pressure of this paw. Systemic injection of low doses of morphine or fentanyl at doses too low to be effective to nociceptive thresholds of control paws. Also direct intraplantar injection of opioids into the inflamed paw resulted in a significant, dose-dependent increase of paw pressure threshold of the inflamed, but not of the non-inflamed paw. Intraplantar injection of (-)-naloxone, but not of the inactive isomer (+)-naloxone, reversed this effect, indicating a local opioid receptor mediated effect. Analysis revealed that μ -, δ - as well as κ -opioid receptor ligands are all active, by an action through the respective specific receptors.

Recent experiments have given some insight into the role of these peripheral opioid receptors in endogenous pain control mechanisms. When rats with unilateral localized inflammation were subjected to cold water swim (CWS), a stress model, withdrawal threshold to noxious pressure was significantly more increased on the inflamed paw than in the non-inflamed paw. This unilateral antinociceptive effect was dose-dependently and stereospecifically reversible by intraplantar administration by naloxone. Testing of receptor selective antagonists indicated the involvement of μ - and δ -, but not of κ -receptors in this stress-induced phenomenon. By means of immunohistochemical techniques the accumulation of opioid peptides (mainly β -EP) in immune cells in the inflamed tissue as well as a considerable increase in the density of opioid receptors in the nerve terminals of this area could be demonstrated. These and further findings strongly indicate that inflammatory processes activate peripheral opioid mechanisms: Opioid receptors, located at nerve terminals, are the targets of the endogenous opioid peptides released from immune cells under stress conditions.

Spectrum of Opioid Receptor-induced Effects

The multiplicity of opioid receptors and ligands is reflected not only in differences in modulation of pain processes (as outlined above), but also in the variety in the overall physiological-pharmacological spectrum of these various opioid systems. Some of these differences are also of interest in view of the use of opioids in the management of pain. Although there is no doubt that μ - and δ -opioid receptors represent different entities, there are many similarities between the effects induced by their activation. It may be that, at least in some cases, functional coupling between these receptor types underlies this effect. In contrast the pharmacological spectrum related to κ -opioid receptors is rather different. Thus κ -opioid receptor activation does not induce respiratory depression and hardly affects gastrointestinal activity. In addition, urinary secretion is not inhibited. In contrast, κ -receptor activation induces diuresis. Significant differences between μ -, δ - and κ -receptor induced effects are also seen in neuroendocrine modulation.

Of particular importance are the effects of the various opioid systems on motivational processes. The high abuse potential of morphine, heroin and other μ -receptor specific opioids clearly indicates that this receptor type activates reward mechanisms, representing the basis for the high abuse potential of these drugs. In line with this experience in humans is the high self-administration rate of such opioids in rats and monkeys. Concerning δ -opioid receptor ligands, much less information is available, probably due to the fact that presently no δ -selective opioids, which easily overcome the blood-brain barrier, are known. κ -opioid receptor selective compounds (such as U-50,488 H) are not self-administered. From this, however, it can not be concluded that κ -receptor ligands lack motivational properties. This becomes obvious from place conditioning experiments in rats, a method which permits the detection of rewarding as well as aversive effects of drugs. Whilst in such experiments μ - and δ -receptor ligands induce clear preference for the conditioned place, κ -receptor ligands cause the opposite effect, i.e. aversion. As such, it may be expected that clinical application of such drugs will not activate reward mechanisms and may therefore lack significant abuse potential.

Implications for Pain Therapy

The accumulation of enormous experimental data on the neurobiology of opioids in the last decade has had far reaching implications for the use of opioids in the management of pain. Some of the most important aspects shall be discussed here. The new insights concerning the sites of opioidergic pain modulation offered new approaches for local application of opioids. The successful direct application of opioids into the brain stem for pain management has been described. This technique, however, may be indicated only in particular cases of intractable pain. In contrast, the direct application of opioids to the spinal cord by epidural or intrathecal injection is now widely used and has proven most useful, e.g. in chronic cancer pain. Its main advantage is that side effects originating from the brain such as respiratory depression and psychological effects may be circumvented. There is no doubt that this technique will become increasingly important as the necessary expertise and facilities become more widely available.

The near future will show whether the recent experimental data on antinociceptive opioid effects in inflamed peripheral tissue will obtain clinical relevance. The advantages which such an approach might promise are obvious: absence of CNS side effects, including addictive processes. Ongoing activities of the pharmaceutical industry to develop opioids (peptides or non-peptides) which do not enter the CNS are underway.

Another aspect of applied opioid research is to make use of the multiplicity of opioid systems, in particular of κ -opioid receptor ligands. The pharmacological spectrum of these ligands (see above), including the expected lack of a significant abuse potential, recommends this group of opioids for such efforts. There are, however, some problems: although κ -opioid receptor ligands exert antinociceptive properties in animal experimentation, the efficacy in the modulation of clinical pain is so far less well documented. In addition, it has to be checked, whether the aversive and psychotomimetic properties of these ligands may be neglected under clinical conditions; there is some indication that this may be the case.

In summary, it may be concluded that the immense progress in the neurobiology of opioids made in the last decade has also opened new and promising aspects for effective pharmacological pain management - although an analgesic fulfilling all expectations is still lacking. The phenomenon of pain is probably too complex and multifaceted to allow the development of the "perfect analgesic".

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PSYCHOLOGICAL APPROACHES TO THE PROBLEM OF PAIN

Dr A.M. HUGHES

Introduction

Pain is the commonest symptom suffered by man. Clinicians, working in all areas of medicine, will be called upon at times to assess and manage patients suffering from pain. It has been said that it "is more important to know the mind" of the patient in pain in order to assist them rather than being fully informed of the patient's bodily health. While the role of psychological factors in pain have been recognized since the earliest recorded history of medicine it has only been in recent years that these factors have been studied in a systematic fashion and regularly employed in the management of pain.

In this lecture I hope to cover the broad, and increasing, area of knowledge on the psychological factors which may influence the distress and disability caused by pain. To impose some order and structure to the lecture I will address the following issues:

- (1) Cultural Background
- (2) Early Experience
- (3) Personality Structure
- (4) Influence of Mood
- (5) Problem of "Hysteria"

Cultural Background

The influence of the cultural background of patients on their subsequent experience of pain has been studied. These studies have revealed that while this appears to have no significant effect on their sensation threshold (the ability to perceive a noxious stimulus) it can affect the pain perception threshold (the level at which a noxious stimulus is perceived as pain) and pain tolerance. The importance of these differences rests mainly on the influence that they have on pain complaint behaviour and while their recognition may confer little advantage in the patient's management it is often vital that these differences are recognized during assessment.

Early Experience

Our early life experiences influence much of our subsequent behaviour in most areas of life. With regard to pain: childhood experience of pain can alter the distress and disability encountered when pain is met in adult life. The parents' attitudes and responses to a child in pain seem particularly potent in determining that child's subsequent abilities to cope with pain. Research has suggested that we may learn our pain behaviour by observing our elders and the increased prevalence of reports of pain in the relatives of patients with chronic pain may support this proposition.

Personality Structure

The presentation of all illness is altered by the personality of the patient. Many studies have confirmed that the personality structure of the patient is a major influence on the pain they perceive. Particular attention has been placed on the personality traits of neuroticism and extraversion. With regard to the former it appears that this is related to the amount of pain a patient will suffer for any given bodily lesion while the latter seems to influence the level of complaint behaviour which will accompany the pain. Psycho-analytical work has further suggested that certain individual's personality structures may make them 'pain prone' as they have difficulties in dealing appropriately with feelings of guilt and inadequacy.

The influence of these factors is sufficiently strong that any assessment of pain, particularly chronic pain, requires to take account of the patient's personality. It is unfortunately easy to overlook these factors during assessment and to be misled. Patients with hysterical personalities, associated with high levels of neuroticism and extraversion, may appear to complain to a degree unwarranted by any physical lesion observed and this can often cause irritation to their medical attendants. A failure to recognize the pathoplastic effects of their personality in this situation may lead to simple intervention being omitted and a failure to treat the patient.

Influence of Mood

Of the many and various mood states man may experience two have been studied extensively with regard to pain - anxiety and depression.

Anxiety

Anxiety is an integral component of acute pain - it is the drive to ensure that the sufferer seeks assistance and aid. While a useful feature it unfortunately heightens the pain the patient experiences and a recognition of this has important practical advantages in that measures which lessen anxiety will ameliorate pain. For example counselling before surgery or relaxation training. A potent source of anxiety is uncertainty and ignorance and good management of all patients in pain will include education and information which by reducing fear will help relieve pain. Feeling that one has lost control over one's condition is another source of anxiety and ensuring that the patient feels able to determine their situation (for example via patient administered analgesia) will also be of benefit.

Depression

While anxiety is a regular concomitant of acute pain, depression of mood is an ubiquitous finding in chronic pain. Patients with chronic pain may become depressed for a number of reasons including a loss of social activity, financial disadvantage, the effects of treatment, and on occasions depression may be a component of the disorder giving rise to the pain. However depression arises its recognition is important as its presence will compound the patient's distress and worsen their prognosis. Research has suggested that the presence of depression may have damaging effects on the family life of the sufferer.

There are many links between depression and chronic pain over and above their frequent co-existence. The neurotransmitters important in depression are also important in analgesia and pain modulation. The finding of the presence of biological markers for affective disorders in chronic pain patients and the family history links between depression and chronic benign pain have suggested to some workers that some forms of chronic pain may be simple variants of affective disorder ("Masked Depression"). However, more recent work which will be described does not support this hypothesis well.

Another link between depression and pain relates to the efficacy of antidepressant medication in the treatment of pain. The pharmacology of this area has been addressed by other speakers and I will not repeat this. Suffice to say that, even in the absence of a clear mood disorder, antidepressant medication can often play a valuable role in the management of chronic pain.

Hysteria

Hysteria is one of the oldest diagnoses in medicine and one of the most controversial. It has always been associated with pain and many of the earliest reports of hysteria describe pain syndromes similar to those we are used to dealing with today. It is a difficult diagnosis to make accurately and one prone to dangerous errors. These difficulties have in the past led in clinicians calling for the abandonment of the term. It has however "outlived its obituarists", though in modern psychiatric classifications it often harbours under alternative names such as 'conversion disorder' or 'somatoform disorder'.

The essence of hysteria is the involuntary production of signs and symptoms of illness to deal with problems of a psychological nature. It is not adequate to diagnose hysteria simply by the absence of physical pathology - evidence of the presence of the psychosocial problems and their importance in symptom formation must be demonstrated.

While it may be dangerous to make a diagnosis of hysteria incorrectly it is often forgotten that it is also dangerous to fail to make the diagnosis when this is appropriate. A failure to recognize this disorder can often lead to needless investigations and treatment with all the risks that these can entail.

Conclusion

Many factors, other than the nature of bodily lesions, can play a part in determining a patient's pain. A recognition of these factors can improve assessment and frequently help guide treatment. Unfortunately there has previously been a tendency to view these psychological factors as only occasionally important or important only in certain cases and to attempt to split pain into "organic" or "psychogenic" types. This split is artificial as unhelpful psychological factors play a part in all pain disorders. A systems approach to the assessment of pain, looking at the various inputs to the system which results in the experience of pain, and determining how these may be altered or modified, would be more valuable.

Pain and Medicine

CLASSICAL APPROACHES OF MEDICINE TO PAIN

Professor J. GYBELS

1. Introduction

People very often seek medical help because they feel pain somewhere, while the physician uses the symptom of pain to determine its cause and treat the underlying problem. The pain sufferer can experience depression, and may even lose the will to live.

Because it is a common experience with diverse psychological consequences, there have been many definitions of pain. It is worthwhile to state from the beginning how pain is now defined in the medical community. Its definition by the I.A.S.P. (an authoritative multidisciplinary International Association for the Study of Pain) reads as follows (1986):

"PAIN is an unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage.

Note: Pain is always subjective. Each individual learns the application of the word through experiences related to injury in early life. Biologists recognize that those stimuli which cause pain are liable to damage tissue. Accordingly, pain is that experience which we associate with actual or potential tissue damage. It is unquestionably a sensation in a part or parts of the body, but is always unpleasant and therefore also an emotional experience.

Many people report pain in the absence of tissue damage or any likely pathophysiological cause; usually this happens for psychological reasons. There is usually no way to distinguish their experience from that due to tissue damage if we take the subjective report. If they regard their experience as pain and if they report it in the same way as pain caused by tissue damage, it should be accepted as pain. This definition avoids tying pain to the stimulus. Activity induced in the nociceptor and nociceptive pathways by a noxious stimulus is not pain, which is always a psychological state, even though we may well appreciate that pain most often has a proximate physical cause."

2. Pain as a symptom

Using three examples we will show how physicians use the appearance of pain to diagnose a disease.

Patient 1:

- This 42 year old male complains of brief and intermittent attacks of stabbing pain situated mainly in both arms but mostly in the medial aspect of the left arm. He also tells that the pain is aggravated by stress and usually promptly relieved by rest. He may also experience during these pains attacks of breathlessness, sweating, nausea and belching. Occasionally he may have a feeling as though the whole chest was compressed in an iron case.

Although the pain is mainly in the arm here a physician will have as first diagnosis an angina pectoris; he will order an electrocardiogram which may show depression of the ST segment; coronary angiography may show typical narrowing of the coronary arteries. If the angina pain is brought on by a little extra stress, the patient's work capacity will be seriously reduced. If he is particularly fearful, there may be an interruption of normal psychological function as well. Usually there is an infarction, although the limitation of activity level may also be a serious threat. This clinical observation shows a feature, with which physicians are familiar and which is important in the interpretation of pain as a symptom; the pain is not felt in the sick organ, in this case the heart, but in the arm. Indeed, under a variety of circumstances pain arising from impulses in one structure, usually placed deep such as a viscus, is referred wholly or partly to some other area, usually superficial. Neurophysiology has offered a rationale for this bizarre phenomenon of referred pain, and it is likely that several mechanisms, such as branching of primary afferents, antidromic activation of receptors at a distant secondary site, reflex muscle contraction, and convergence of visceral afferent nociceptors on the same pain-projection neurons as to which the afferents from the somatic structures in which the pain is perceived, project. This acute pain is linked to the noxious stimulus, which is probably abrupt anoxemia of the cardiac muscle. Other stimuli capable of inducing pain in visceral structures are abnormal distension and contraction of the muscle walls of hollow viscera, rapid stretching of the capsule of the visceral organ, formation and accumulation of pain-producing substances amongst others. Our knowledge of the primary afferents that innervate deep structures such as muscle, joint and gut is less complete than for the cutaneous afferents. It has been possible however to show that there are classes of visceral afferents that respond best to intense stimuli.

Patient 2:

- This 50 year old lady developed suddenly a paralysis of the left side of her body. A few weeks later she started to complain of severe pain in her paralysed side, burning in quality, continuous, and spontaneous, but with exacerbations. Although on sensory examination she presents a hypalgesia on the left side of her body, that is to say a pin is not felt as sharp and painful, however the slightest touch, such as that from bedclothes, can be felt as very hot and painful.

The severity of this type of pain can be extreme. In most cases it persists indefinitely and it often totally disrupts the patient's life. The physician will diagnose this pain as "central pain", resulting from injury to the nervous system. This pain is not linked to the stimulus and does not depend on activation of peripheral nociceptors, as is the case in patient 1, but results from a dysfunction in the signal elaborating machinery of the nervous system. Exactly where and how in the various subgroups of pain related to intrinsic neural abnormality the substrates of pain sensation swing into action remains to be elucidated. Possible mechanisms which are proposed and for which there is some experimental evidence are, spontaneous hyperactivity of deafferented pain transmission neurons with the development of quasi epileptic foci, plastic changes with the formation of aberrant inputs to deafferented nociceptive neurons, loss of afferent inhibition resulting in an exaggerated response to a nociceptive input etc...

Patient 3:

- This robust and athletically built man had been admitted to the rheumatology ward because of severe chronic pain complaints in his right arm and hand, which had started after a mild case of now cured peri-arthritis scapulo-humeralis.

Despite his athletic figure, this 32-years old person looked like someone of 52. As a matter of fact, he actually considered himself as totally decrepit. In contrast, he spoke very proudly about his previous physical strength and endurance. From the age of 16 he had been used to doing very strenuous hard work. At first he had been a building trade worker, later on he had become a bulldozer-driver, and besides this he had built not only his own house, but also helped in building or rebuilding the houses of his numerous brothers and sisters. He literally said: "I was never tired. I never needed vacations. But all this has ruined my whole body, and especially my arm". The way this patient handled his painful arm was very typical. Entering in the physician's consultation room, he took it up and put it down on a desk, as if he considered his arm as a lifeless object. During several interviews, it became obvious that this man lived with a mythical feeling of physical omnipotence and invulnerability, and as a consequence, he had totally exhausted his body without realizing that he was doing so.

He feels his relative invalidation by this peri-arthritis as a narcissistic injury as something he could not accept nor integrate into his life. His painful and powerless arm in a way represented his totally collapsed self-esteem, but at the same time, being fixated by his physical suffering, he partially restored his narcissistic self-image, because this allowed him to feed the illusion that he might function again as he used to "if it were not for this damned pain".

These three examples underline that pain has many different facets. Unlike acute pain, of which the first patient is an example, and which serves to warn of impending tissue damage, or the need for rest, chronic pain, of which the second and third patients are examples, seems to have no clear biological function. Contrary to the view of some theologians and philosophers, the medical profession rarely observes that chronic pain is uplifting or ennobling. The chronic pain syndrome is characterized by the appearance of signs of depression and a masked depressive affect. The chronic pain patient adopts the sick role with the behaviours of chronic invalidism and associated hypochondriasis.

These behaviours include decreased activity levels, with a reduction of income levels and difficulties in family relationships, doctor shopping, polypharmacy, multiple operations, etc... Thus it is recognized now that whereas in acute pain the pain is a symptom of a disease, in chronic pain the pain itself becomes the disease.

This will indeed have important repercussions for treatment.

3. Pain treatment

To discuss pain treatment it is useful to distinguish three broad categories of pain problems.

- 3.1 Patients with acute and subacute pain with an identified somatic cause: the first step is to treat the underlying cause. If this approach fails, one provides adequate pain relief with usual methods, such as drugs; this is usually not a serious problem and need not be discussed here.
- 3.2. Patients with an identified somatic cause such as arthritis, cancer or a lesion of the nervous system, but with persistent pain. Let us take the example of a cancer which cannot be treated any more. Drugs are the mainstay of cancer pain management. If used correctly - the right drug in the right dose at the right time intervals - they are effective in a high percentage of patients. Since the WHO has recognized many obstacles worldwide to effective cancer pain relief treatment such as poor drug availability, misguided national drug legislation, lack of education of doctors and nurses, under-prescribing and under-dosing by the professionals, wrong timing of drugs given, fear of addiction and lack of public awareness that pain can be controlled, this organisation has developed guidelines, which are known as the ladder approach.

This ladder approach is simple. The drugs increase in strength from non-opioids such as aspirin, to weak opioids such as codeine, to strong opioids such as morphine until the patient is free from pain. If a drug proves ineffective, a stronger dose rather than a different drug is prescribed. The drugs are not given "as required" only at times of pain, which is the usual practice "but every 4 to 6 hours" by the clock. Additional drugs, "adjuvants" are used under certain conditions such as psychotropic drugs which may be used to calm fears and anxiety.

It is to be observed that international drug legislation (Single Convention on Narcotic Drugs 1961, as amended by Protocol of 1972 of the United Nations, 1972; and the Convention on Psychomimetic Substances, United Nations 1971) does not hinder the access to recommended pain controlling drugs but national drug regulation officers may do so, e.g. in 1988 not a single tablet of oral morphine was available legally in India, a country with one sixth of the world's population, yet injectable morphine was. This is too expensive for the average rural family and moreover not the optimal way of giving morphine. It should be stressed that in the treatment of patients with persistent pain the prolonged use of potentially addictive drugs is not advisable. Morphine-like drugs are the most

effective painkillers available, and experience has then taught that in patients with persistent pain with prolonged use their major side effect such as constipation and sedation are usually mild. The use of these drugs in ambulatory patients with pain due to cancer is now well accepted in the medical profession and there is simply no justification for withholding adequate doses of opiates from cancer patients who need and tolerate them; these patients usually do not get addicted. There is a medical controversy however whether to use morphine-like drugs in patients with persistent pain that is not associated with malignancy.

When patients with persistent pain with an identified somatic cause do not respond to drug treatment, it may be useful to try alternative treatment approaches and these include transcutaneous nerve stimulation, relaxation, self-hypnosis treatment, etc... In these alternative treatments, important cultural differences are apparent e.g., acupuncture, which was known to the ancient Chinese, has only recently enjoyed a surge of popularity in the West; however, to my mind the specific indications for "acupuncture" have not been formulated and its analgesic efficacy has not been well defined. The ablative neurosurgical procedures on nociceptive pathways have diminished markedly over the last decades by the recent development of chronic intrathecal administration of opioids and neurostimulatory techniques. Some of these techniques are still in an experimental phase. For instance, there are many clinical indications that some patients with central neurogenic pain, like patient 2 in which alternative treatments have failed, might be helped by stimulating through a stereotactically placed electrode in the depth of the brain, and more particularly the sensory thalamus or the internal capsule. This method is advanced technology and can be highly efficient, however, it is still an experimental stage, and is not yet an established routine method. It is mostly performed by those neurosurgeons who have a major interest in pain and its physiopathology; in their hands it is a very safe method. However, these neurosurgeons will tell you that knowledge of how electrical stimulation of the brain in these conditions has a suppressive effect on persistent pain remains fragmentary and that in explaining it one is on less firm grounds than was thought a decade ago.

- 3.3 Many patients with persistent pain have several interacting problems that complicate care, such as psychiatric disturbances, environmental reinforcers of learned pain behaviours, drug abuse, and so on... In recent years, it has been realized that such patients are usually best helped by a multidisciplinary approach that evaluates all potential factors contributing to the persistent pain syndrome and develops a treatment plan that addresses both medical and psychological problems. For this approach a patient may now be referred to a so-called "multidisciplinary pain clinic" where evaluation and treatment is time consuming and may be expensive. In spite of all this effort the patient often is not helped; this is so because all the factors that contribute to this persistent pain syndrome are not understood.

4. Three more points which need to be mentioned to situate pain in the framework of medicine

4.1 Pain is an important health and social problem.

In 1985, in the USA, a nationwide telephone survey was made of 1254 persons aged 18 and older representing a cross-section of the adult population in the United States. This survey provided quantitative data on the prevalence and severity of different kinds of pain, the demographic characteristics of those with pain, the impact of pain on work and other activities, the relationship between pain and measures of stress, and the use of medical and other professions in pain treatment. This survey is known as the Nuprin Pain Report. Some of the data from this report are self explanatory:

- For all pains and all adults, more than 4 billion work days were lost in 1984, about 23 days per person. This group includes those employed full-time, those employed part-time, and those working at home. For full-time employees only, 550 million days were lost, about 5 days per person. According to Bonica (1985) world-wide each year pain is experienced by over 3 million patients who actually die from cancer and by over 16 million patients in the remaining cancer population. Depending on the type and the site of the neoplasm, pain is experienced by 20% to 50 % of patients when the lesion is diagnosed, by nearly half of the patients in the prevalence group, and by 55% to 95 % of the patients with advanced or terminal cancer. It is thought to be moderate to severe in about 50 %, and very severe or excruciating in another 30 %. It is estimated that in the developed countries pain is inadequately managed in 20% to 40 %, possibly more. In the developing countries, where more than half of the world's cancer patients are and where most are incurable at the time of diagnosis, pain relief, often the only relevant human alternative, is by and large not offered.

4.2 The pain problem needs research and this research has particular ethical implications.

The vast majority of experimental work on pain is concerned with nociception, and the fact that this work contributes to the knowledge of chronic pain is well recognized. However, many clinicians who are confronted with patients with chronic pain object, and with reason, to identify this "douleur maladie", to use Leriche's terminology, with the "douleur laboratoire". Since chronic pain is such a frequent and most urgent clinical problem, many pain researchers feel that we must try to understand its biological mechanism, and therefore experimental studies using animal models of chronic pain are a necessity. An example of such a model is the rat in which arthritis has been induced by injection of killed Mycobacterium butyricum in the base of the tail. This represents a dilemma; as pain researchers, we have to produce the very sensations that all ethical guidelines for animal experimentation forbid. For this reason, an important International Society concerned with the Study of Pain (IASP), has, through a committee for research and ethical issues, established ethical guidelines for its

members for investigations of experiments on pain in conscious animals. Some of these guidelines read as follows:

- a) It is essential that the intended experiments on pain in conscious animals be reviewed beforehand by scientists and lay-persons. The potential benefit of such experiments to our understanding of pain mechanisms and pain therapy needs to be shown.
- b) Measures should be taken to provide a reasonable assurance that the animal is imposed the minimal pain necessary for the purpose of the experiment.
- c) The duration of the experiment must be as short as possible and the number of animals involved kept to a minimum.

This society considers it as one of her important responsibilities to present to the public and to politicians clearly and unambiguously the case for the use of animals for the investigation of pain, antinociception, and analgesia, so that the activities of respectable groups might not lead to the prohibition of valuable animal research which is necessary to reduce human pain and suffering.

Experimental work on pain has also to involve human subjects. Let us take an example in my own area, which has to do with central pain, as experienced by patient 2.

The neural mechanism which causes deafferentation pain is not known. One important theory postulates that due to the lesion, neurons devoid of their normal input become hypersensitive and behave like quasi-epileptic foci, and thereby excessively stimulate neurons which are implicated in pain sensation. An ideal experiment would be to equip the electrode used for therapeutic stimulation with a microelectrode so that neuronal activity can be recorded for long periods of time. This, although a different technical task, can be tackled through co-operation. It seems unlikely that all the necessary information could be obtained from animal experiments however and this type of research does not impose on the patient interventions other than those required to give the best kind of treatment available.

The research results are a by-product of a well established form of treatment but probably will not benefit the patient directly. A clear answer to the question: "Is deafferentation pain due to the presence of quasi-epileptic foci?" would permit experimental animal research to address the core of the problem, and eventually make the implantation of an electrode in the human brain for the treatment of "intractable" deafferentation pain unnecessary. It is my opinion that not many people would object to this particular human experiment, provided, of course, that the rules of the declarations of Helsinki and Tokyo were followed.

4.3 The need for education

Besides basic and clinical science, education has a direct impact on the management of pain. We referred earlier to the fact that pain is an important health problem, and that there is impressive evidence that many patients are inadequately relieved, although with the existing knowledge many patients can be helped. Many factors have been recognized as contributing to this sad state of affairs, and several steps have been taken by the health professionals to find a solution to this problem. These include international symposia, societies, and medical journals, textbooks, informative brochures for health care and the lay public. However, most formal decisions as to the management of pain are made by physicians and therefore they should be well trained for this task. It has been obvious for some time now that medical undergraduate teaching on the subject of pain is far from optimal, and therefore adapting the medical undergraduate curriculum could have far reaching consequences and should be pursued vigorously, however experience teaches this is never an easy task.

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ACUPUNCTURE AND OTHER PAIN RELIEVING PROCEDURES

Professor H. TAKAGI

INTRODUCTION

Recently, there have been marked advances in understanding the neurophysiological and neurochemical mechanisms of the generation and suppression of pain. These are findings of 1) pain producing substances, 2) pain transmitters, 3) pain modulating substances (opioid peptides etc.), and 4) pain suppressing systems.

In particular, the existence and the nature of the pain suppressive systems in the central nervous system have been established by many investigators. These findings provide some theoretical basis for the treatment of pain, particularly persistent pain, or chronic pain. The pain suppressive systems consist of, at least, the following two systems (Takagi, 1982; Basbaum and Fields, 1984):

1. Descending suppressive systems projecting from the brain stem to the spinal cord (Fig. 1). These consist of at least two sub-systems:
 - a) Periaqueductal gray (PAG)-raphe magnus (NRM)-spinal dorsal horn system: mainly mediated through serotonin;
 - b) Nucleus reticularis paragigantocellularis (NRPG)-spinal dorsal horn system: one is mainly mediated through noradrenaline and another is mainly mediated by opioid peptide, such as Met-enkephalin, and kyotorphin, an endogenous Met-enkephalin releasing peptide.
2. Segmental suppressive system in spinal cord which is mediated by Met-enkephalin, dynorphin, GABA etc.

In Japan, various treatments are used for treatment of persistent pain or chronic pain and in some hospitals the combined application of western and oriental treatment has been adopted.

These are:

- 1) Pharmacotherapy:
 - a) analgesics (opiates, non-opiate analgesics)
 - b) non-analgesics (anti-epileptics, anti-depressants, serotonin-antagonist etc.)
- 2) Nerve block with local anaesthetics, etc.
- 3) Neurosurgical treatment
- 4) Electrical stimulation of:
 - a) brain or spinal cord
 - b) body surface: transcutaneous electrical nerve stimulation (TENS)

- 5) Acupuncture and its modified methods
- 6) Laser treatment: "laser acupuncture"
- 7) Arginine treatment which causes an enhancement of release of Met-enkephalin through the increased biosynthesis of kyotorphin, an endogenous Met-enkephalin releasing peptide
- 8) Kampo treatment (Japanese herbal medicine): therapy with crude drugs
- 9) Psychotherapy
- 10) other physical methods: application of heat, cold, rubbing, massage, "shiatsu" (localized mechanical press with the finger to the trigger points) etc.

The effects of some of these treatments are probably obtained through the activation of the pain suppressive systems which induces analgesia.

These are: a) morphine and related opioid drugs, b) electrical stimulation of brain or spinal cord, c) TENS, d) acupuncture and its modified method, e) laser treatment, f) arginine treatment (a new method). Among these, I would like to describe d), e) and f).

ACUPUNCTURE

Acupuncture and moxibustion, a branch of Oriental Medicine, which originated in China several centuries B.C., were introduced in Japan in 562 by a Buddhist priest who studied in China. Since that time, Chinese medicine and acupuncture have been utilized as a form of folk medicine in Japan.

As far as we understand it, the traditional concepts of Chinese medicine are as follows:

1. Illness is a manifestation of imbalance of the whole body function.
2. Treatment aims at the regulation of the whole body function.
3. Remedy has its origin in food.
4. Acute effects of treatment should not be expected, and repeated treatments are required. It will take at least three weeks or more to get an effect.

However, until 30 years ago acupuncture had never been used in the westernized hospital because its scientific basis and effectiveness seemed to be uncertain. In the 1960s, acupuncture was introduced to the Pain Clinic, Department of Anaesthesiology, Osaka Medical College, Japan, by Professor M. Hyodo as one kind of stimulation therapy for the treatment of pain, particularly, persistent or chronic pain. Since then, acupuncture has been adopted by other pain clinic specialists as a choice between many procedures for the treatment of pain.

The basic technique of acupuncture involves the selection of acupuncture therapeutic points (meridian points; Tsubo), insertion of needles to meridian points and application of low frequency (2-6 Hz) electrical stimulation through the needles. Some patients fear the insertion of needles. Concerning this drawback some improvements to the system were made in Japan.

- 1) Device for needle guiding by Kazuichi Nakatani (1920): with this device, the manipulation of the needle became so easy that the use of very fine needles (the so-called Japanese needle) became popular.
- 2) Electric resistance meter ("Neurometer") by Yoshio Nakatani for the location of meridian points (1950): all meridian points have the tendency of electroporability, particularly pathological meridian points which exhibit a marked high electroconductivity. Using the Neurometer, the location of meridian points became easy (Shinohara et al. 1986). After treatment, the electroconductivity returns to the normal level.
- 3) Device for the needleless acupuncture by Masayoshi Hyodo (1978): Professor Hyodo has introduced a special type of skin surface electrode, a conic metal electrode, made of brass plated with silver, where the sharp points are pressed on the surface of meridian points and low frequency current is conducted through the electrode. This type of electro-acupuncture is named SSP (silver spike point) therapy. With regard to the analgesic effect, SSP therapy gives 70-80% of that obtained by acupuncture needle (Hyodo 1984). The result is that, acupuncture is becoming more popular in Japan.

The effectiveness of acupuncture is certainly influenced by the selection of meridians, and patients. Acupuncture is often used as an adjuvant treatment to nerve block. For example, in the case of low back pain due to osteoarthritis of the spine, acupuncture is indicated for the remaining residual pain after two or three epidural nerve block treatments. Pains over the whole body, atypical facial pain, referred pains, functional visceral pains, stiffness of the muscles, reflex sympathetic dystrophy and deafferentation pain not being amenable to other treatments are applicable to acupuncture (Hyodo, 1985). In general, pains which do not respond to other treatments are often an indication. For such patients, beneficial effects of acupuncture are often observed, but it is not the case for all patients. One disadvantage of acupuncture is that we cannot predict which patient will show a good response to acupuncture and we have to use it in a trial and error fashion.

According to the basic concept of traditional Chinese medicine, acupuncture-induced analgesia is due to the improvement of the general body function, but it is difficult to prove. It must be noticed that acupuncture analgesia was blocked by an administration of naloxone in human (Mayer et al., 1977). The SSP-induced analgesia is also blocked by naloxone (Hyodo, 1985). These results are suggesting involvement of opioid peptides, but it is unclear which peptide is involved in acupuncture-induced analgesia. Zhan et al. (1980) have shown that opioid peptides (Fraction I, II) increased in human cerebrospinal fluid (C.S.F.) after acupuncture. Clement-Jones et al. (1980) have demonstrated that beta-endorphin but not Met-enkephalin levels increases in human C.S.F. after acupuncture treatment for recurrent pain. Moreover, Han et al. (1980)

reported that the lowering of cerebral serotonin content with 5, 6-dihydroxytryptamine reduced the effectiveness of acupuncture-analgesia in animals. Several neurophysiological studies have showed that the pressure receptors in the deep tissues mostly, and the stretch receptors to a lesser degree, are activated by acupuncture. Afferent impulses from these receptors are conducted mainly by the medium sized nerve fibres (group II and III) (Chang, 1978) which then reaches the brain (Chang, 1980). Thus, it is conceivable that the descending pain suppressing systems are activated by acupuncture. If such is the case, the presence of acupuncture-responding and non-responding patient suggests that the effectiveness of acupuncture may depend on individual functional variations of the pain suppressive systems.

Treatment with Low Reactive Level Laser

It is well known that the high reactive level laser (1 Watt) is used as a "laser-knife" in surgery and in other fields. Recently, low reactive level laser has been adopted as a kind of stimulation therapy and applied for the treatment of pain. The semiconductor laser diode (GaAs; 60 mwatt) is developed for this purpose. Its wave length of 830 nm reaches deep tissues when applied to the skin surface of the meridian points. Laser stimulation (5-180 seconds irradiation for each trigger point and repeat) produces analgesic effects. Mechanisms of laser treatment are not clear, but it is shown that laser treatment causes an improvement of decreased blood circulation of the regional area. In addition to this, an involvement of similar mechanisms to acupuncture is also considered.

Finally, one of my collaborators, A. Harima, is trying the use of laser irradiation through the skin of the neck to block the stellate ganglion and get successful results in terms of analgesia. This is another type of the application of laser. Further studies are however required to fully evaluate the laser treatment.

Arginine Treatment

Arginine, which is a precursor of kyotorphin, an endogenous Met-enkephalin releaser is a new method for the treatment of persistent pain.

Neurophysiological and pharmaceutical background.

Kyotorphin (tyrosine-arginine; Tyr-Arg) is a neuropeptide isolated from the bovine brain by Takagi and his associates in 1979. Recently, it has been also found in the human cerebrospinal fluid (kyotorphin content : 2-5 pmol/ml), suggesting that the human brain contains kyotorphin. We found that kyotorphin is distributed unevenly in regions of the rat brain and is particularly high in concentration in the lower brain stem (pons and medulla oblongata). When brain homogenates were subcellularly fractionated, the amount of kyotorphin was highest in the synaptosomes suggesting that kyotorphin contents is high in the nerve terminal. Kyotorphin has an analgesic action which is blocked by naloxone. Further studies have shown that kyotorphin produces an opioid analgesia through an increased release of Met-enkephalin release from the slices of the brain and spinal cord, but not beta-endorphin (Takagi and Ueda, 1988).

We found that kyotorphin is physiologically synthesized in the brain by a specific enzyme, kyotorphin synthetase, from two amino acids, tyrosine, and arginine. We identified a kyotorphin synthetase in the soluble fraction of rat brain synaptosomes (synaptosol) and characterized it. The enzyme, partially purified, showed an absolute requirement for ATP, MgCl₂, tyrosine and arginine. The enzyme reaction is represented by the following equation (Ueda et al. 1987, Takagi and Ueda, 1988):



The regional distribution and subcellular localization of the synthetase showed a close correlation to that of kyotorphin levels in the rat brain. Interestingly, an administration of arginine, but not tyrosine, increases the content of kyotorphin in the brain and correspondingly showed an analgesic effect in mice. A systemic administration of kyotorphin itself does not show analgesic effect, because it does not enter into the brain and it is rapidly destroyed by aminopeptidase.

Clinical Analgesic Effect of Arginine Treatment.

Considering the above results, we tried clinical application of arginine to that of chronic pain. It is well known that arginine is a physiological amino acid in the body. Fortunately, the arginine solution (10% solution, 300ml in a bottle) is marketed as a clinical diagnostic reagent for the endocrinological test of the hypothalamo-pituitary system. For diagnostic purposes, an intravenous drip infusion of arginine solution (300ml in 30 min) has been used. We also used drip infusion of the same arginine solution and the same dose (300ml/60 kg; 0.5 g/kg) for the treatment of pain. Before the administration of arginine we made a description of the trial to the patients and got their agreement. We selected 10 patients with various kinds of chronic pain; 3 postherpetic neuralgia, 1 cluster headache, 1 neck-shoulder syndrome, 1 cervical, thoracic spine sprain, 1 low back pain due to spondylosis deformans, 1 malignant rheumatoid arthritis, 1 shoulder pain due to peri-arthritis, 1 central pain after central infarction. Pain was assessed by the patient, using a 10 cm visual analogue scale, before and after arginine infusion. Blood pressure and heart rate were measured before and after arginine administration.

The arginine treatment reduced the intensity of pain in all the patients and a marked decrease in the mean pain score (from 10 to 3.5) was seen about one hour after an infusion of arginine (table 1). The analgesic effect is associated with a warm feeling of the whole body over a period of 6 to 20 hours. Repeated administrations were given upon patient's request and no tolerance was observed in such cases. A slight decrease in blood pressure (10-15 mmHg) after arginine infusion was seen. Dryness of mouth, and drowsiness or slight sleep were observed in some patients during arginine infusion, suggesting that the grade of pain decreased.

With regard to the mechanisms of clinical effects of arginine, we have to consider two possibilities. First, arginine-induced analgesia is mediated through the increase in kyotorphin content in the CNS which in turn increases the release of Met-enkephalin. Secondly, arginine is a possible precursor of endothelium-derived nitric oxide which is a relaxing factor of the vascular smooth muscle (Schmidts et al., 1988). The arginine-

induced warm feeling of the body may be due to the action of nitric oxide formed in the vascular endothelium.

Our approaches may throw a scientific light on a concept of the oriental medicine that remedy has its origin in food.

Summary

In some hospitals in Japan, the combined use of western and oriental procedures for the treatment of chronic pain are successfully used. The present state of acupuncture, modified acupuncture, laser treatment ("laser acupuncture") and arginine treatment in Japan are being reviewed. All these procedures probably produce analgesia due to the activation of the pain suppressive systems.

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SESSION 2 RAPPORTEUR'S STATEMENT

Dr Annette KAPLUN

In recent years our understanding about pain has advanced considerably. We have come to distinguish three broad categories of pain problems: patients with acute or sub-acute pain with an identified somatic cause; patients who experience persistent pain due to arthritis and cancer or a lesion of the nervous system; and patients who report persistent pain in the absence of tissue damage or any likely pathophysiological cause. In the first and second instance, the pain is the symptom of a disease; but in chronic pain, the pain itself has become the disease.

Whatever the cause, pain is experienced in a part or parts of the body; it is unpleasant, sometimes unbearable, and therefore an emotional experience. Pain is always subjective. The Japanese use the word "shintu" which refers to mental pain, suffering and trouble.

The papers presented brought out clearly three points. First, there have been marked advances in the understanding of the neurophysiological and neurochemical mechanisms of the production and suppression of pain. The identification of opioid receptors and the detection of their endogenous ligands initiated a new phase of opioid research which also offered new insights into pain mechanisms and the management of pain. There is increasing evidence that opioids are able to elicit antinociceptive effects also at peripheral sites in inflamed tissue. Pain relief can thus be obtained while avoiding the side effects of opioids at the cerebral level.

Second, our knowledge is also increasing with regard to the psychological factors influencing pain. These factors include the cultural background of the patient which can affect the pain perception threshold and pain tolerance; early experience in childhood, when we learn our pain behaviour by observing elders; the personality structure of the patient which has a major influence on pain perception and makes certain persons "pain prone"; the influence of mood, such as anxiety and depression. Finally, a distinction must be made between hysteria and chronic pain.

Third, important steps forward have been made in treatment. Reports were presented on the combined use of Western and Oriental procedures in dealing with chronic pain in Japan - among these "laser acupuncture" which is acupuncture without the use of needles. Arginine treatment is a new, promising method which seems to produce analgesia due to the activation of the pain suppressive systems.

It has become quite clear that the treatment of chronic pain conditions with methods that are only applicable to acute pain represents a failure in providing adequate care. This brings us to a key issue: most formal decisions as to the management of pain are made by physicians. Yet, many patients are inadequately relieved. Why is this? At the root of the problem we find:

- a lack of knowledge among the medical and health professions with regard to simple and reliable methods of pain management;

- a lack of awareness of the importance of the psychological context of the patient and failure to recognise the role of their personality in chronic pain.

What are some implications of these findings? Three areas require our attention: research, education of the public, and training.

Research

Many questions still need to be answered. What is the real nature of the interaction between the somatic, the mental and the spiritual levels? We have little information on the subject. A plea must be made for research dealing with case studies, with "biographies". What is it that makes a person able to cope better than another? Why is it that this person suffers from chronic pain at this time, in these circumstances? Much could be learned from research into the coping process and the subjective experience associated with chronic pain. What we need is qualitative data, not only quantitative data.

Education of the Public

A wealth of information exists. Yet, most people with chronic pain do not know where to go or who to ask, they do not know what to do. The media have a major responsibility - and the health professions vis-à-vis the media, in making this information go beyond a small circle of experts and promoting a correct view of chronic pain.

Training the Health Care Providers

As many speakers pointed out, this is a very difficult task. There is an urgent need, however, to reorient training and to change attitudes among professionals through appropriate knowledge of recent scientific findings. A major goal should be to develop in health care providers the skills to provide support to patients and enable them to cope better, as well as their families. Effective interventions require careful listening in order to discover why patients are in pain. Unfortunately, real concern and awareness of a patient's emotional life is often totally absent in medical practice. Our challenge in dealing with pain patients is not a medical one, but a psychosocial one.

It is essential to encourage pain patients to use fully their potential for active participation and to make them familiar with existing possibilities for action leading to effective change. Social support, sympathetic care and acceptance, the readiness to help oneself, all have a decisive influence on chronic pain conditions.

As Professor Malherbe stated at the opening session, the art of medicine implies "coming to the person who suffers". It means communicating, understanding, and enabling patients as well as their social environment to maximize their quality of life despite the illness.

SESSION 3

SOCIETAL ASPECTS

PAIN AND PUBLIC HEALTH

Professor K. ATSUMI

Introduction

As already mentioned by many speakers, chronic pain is different from acute pain and it is one of the most costly health problems in modern society. More particularly chronic pain syndrome is a complex array of problems associated with sensory, perceptual, psychological, psychosocial, and environmental events. Therefore, a multidisciplinary team approach is necessary to find appropriate diagnosis and therapy. Along with the high expense of treatment, the social side effects of chronic pain are very damaging; according to Dr Handler, 70% of patients with pain end up divorced and 20% of them attempt suicide.

Historical Perspectives of Pain

I would like to begin by introducing the historical perspectives of pain with reference to Dr Todd in 1985 who classified the subject from primitive society to the early modern era of the middle of 16th-17th century.

In primitive society, the source of pain was external and pain was considered as an intrusion of objects and spirits, with the result that treatment was directed towards extra-corporal flights of fancy. In the Egyptian era anatomical knowledge was poor and no knowledge of the nervous system existed. The heart had prominence over all organs of the body and the concept of pain was studied using magico-religious influences. The sacred book "Rig-Veda" was written in India, 4,000 years B.C., and it describes hundreds of remedies from mineral, plant, and animal sources of anaesthetics, and analgesics. The surgeon "Susruta" introduced healing and therapeutic measures for diseases and mentioned a pain pathway. However, Buddhism was sceptical of scientific discoveries and the existence of pain was denied.

The ancient culture of Mesopotamia was born in the region of Euphrates and Tigris Rivers. At that time the "Code of Hammurabi" was written. However, in spite of the progress of art, architecture, astronomy, and law, medicine never reached a high standard. In China, one of the oldest cultures in Asia, medical experiences were stored and expressed in a special way. Chinese people viewed the human predicament as a microcosm of the harmonious universe and recognized that the balance of polarity of Yang and Yin was an important medicinal influence. In the Chinese book of medicine "Nei Ching", Yang and Yin were described. According to the book, nature is made of five elements and the body of five organs - heart, lungs, liver, spleen and kidneys. Natural laws regulate the universe and the human body. The brain was simply considered as the marrow of the skull and upsets of Yang and Yin caused pain in particular organs.

Hellenic Greece is a wonderful era in the history of human society. Glorious cultures were opened and bloomed. Pain relieving drugs and healing arts were mentioned in the Homeric legends and in Greek mythology. The medical doctor "Alcmaeon" who lived around the time 500 B.C. considered the brain as the centre of sensation. Mechanism of consciousness was recognized to depend on cerebral circulation, whereas nervous communication was deemed to be achieved by the particles of elements. The philosopher "Democritus" mentioned that "All matter was composed of the four elements - fire, air, earth and water. The atomic theory was introduced to understand sensation and pain. Pain was considered as an intrusion of sharp particles to disturb the normal calm of the soul's atoms.

Hippocrates knew already about the "healing power of nature". At that time anatomy was rudimentary and physiology was based on the balance of the four elements, heat, cold, moisture and dryness. These were present in every body and pain was considered as a manifestation disturbing the natural state of equilibrium in a healthy body. Surprisingly, effective measures for the treatment of pain such as, opium, mandrake, hemlock, cooling, physiotherapy, and pain surgery were taken. Plato believed that pain was perceived by the soul and how it responded to the four elements. Aristotle considered that the role of the brain was that of a thermostatic sponge cooling the heart to prevent overheating, vital heat in the heart's blood controlling sensitivity to pain.

In the Alexandrian age, two famous medical doctors were born - Herophilus, and Erasistratus. Herophilus thought that the brain was the seat of motor and sensory functions after having made dissections on human cadavers where he studied the course of nerves to and from the brain and spinal cord, and Erasistratus recorded the difference between the cerebrum and the cerebellum. In the Roman era, Galen mentioned that pain was the lowest form of a conscious sensation. A medical school was founded in Jundishapur in the Islamic age and Avicenna described a medical book written at this time. In the book, 15 varieties of pain were produced by humoral changes and three groups of medicinals for pain relief; opium, herbane, and mandrake, were listed.

In the Dark ages pain was perceived in the light of Christian Doctrine as a means of purification, and redemption. Western medicine and pain concepts deteriorated to primitive levels. However, in the Renaissance period, famous medical scholars appeared such as Berengarius, Vesalius, and Eustachius. Leonardo da Vinci performed anatomical dissections and considered pain as the intense aspect of the sensation of touch. Paracelsus discovered that ether was a sleep inducing substance.

Ambroise Pare mentioned carotid compression aesthesia. At that time, application of cold for local anaesthesia was tested. In the 17th century, "De Motu Cordis" was written by William Harvey and Von Helmont, who proposed the idea of physical transmission of nerve impulses in motor and sensory process.

Finally in the middle of the 20th century, the modern understanding of pain was studied and it was recognized that the thermal and chemical nociceptors involved prostaglandin receptors on nerve endings.

Modern Methods of Diagnosis and Treatment of Pain by Bio-Medical Engineering

In this symposium, many distinguished speakers have presented interesting papers on the current status of pain in medicine. I would like to now introduce modern methods of diagnosis and treatment of pain from a biomedical engineering point of view.

It is an attractive challenge for doctors to detect the existence, location and intensity of pain in the patient, and thermography is currently considered as one of the best methods to objectively detect pain. Thermography can demonstrate thermal abnormalities in the body's radiation emission pattern and pathophysiological disorder. Neurovascular, soft tissue, circulatory, and musculoskeletal disorders can be detected.

Hippocrates, more than two thousand years ago mentioned "In whatever part of the body heat or cold is seated, there is disease". This ancient diagnosis can be realized by the recent progress of infra-red technology utilizing thermography. A fine thermal difference with 0.05°C sensitivity can be detected. Therefore, inflammation, malignant tumor, arterial obstruction, hormone and metabolic disorders, neuropathic disorders and psychogenic pain syndromes can all be identified. This is due to the fact that in healthy individuals, the average temperature difference between both sides of the body are extremely small, but in neuropathic disorders, hyperthermia appears in the acute stage, and hypothermia in the chronic stage.

Dr Handler et al, analyzed 224 patients with psychogenic pains and 43 of them showed thermographic abnormalities with reflex sympathetic dystrophy. In the diagnosis of lumbar disc disease, Edeiken detected abnormal thermograms in 23 cases out of 29. The accuracy ratio is 80%.

Pochoczevsky examined thermograms for two groups of patients, one group comprised of 38 patients and the other of 48. Abnormality was detected with a 79% and 92% accuracy ratio respectively. These are good results compared with a myelogram which is an invasive method.

Delware Pain Clinic studies on the diagnosis of chronic low back pain showed that a 93% accurate diagnosis could be obtained by thermography in 164 patients. The same clinic also reported results on the comparison of a diagnosis for neurovascular compression syndromes, accuracy by thermogram here was 74%. Dr Wexler reported the 93% accurate diagnosis on nerve root irritation by thermography. This greater accuracy is due to the fact that thermography reveals sensory nerve abnormalities and not those of the motor nerves. Le Roy reported on the diagnosis on thoracic outlet syndrome, accuracy of the thermogram here was 74%.

Physical therapy for pain includes cryotherapy, heat, electrical stimulation, soft tissue massage and therapeutic exercise. Cryotherapy can be applied in both acute and chronic pain. The effect of cold depends upon peripheral vasoconstriction. Using cryotherapy, it is found that tissue metabolism, histamine release, lymph production, oedema formation, and nerve conduction velocity are reduced. The Gate theory is considered to be one of the causes of the effects seen.

The heat effects on pain relief are sedation, muscle relaxation, and pain reduction. These effects come from the decrease of vasomotor tone and increase of blood flow and tissue metabolism. Electrical stimulation, such as "TENS" - Transcutaneous Electrical Nerve Stimulation - has been also widely used for pain relief. The purpose of TENS is to stimulate sensory nerves and parameters which can be changed in the intensity, pulse width, and rate. Many kinds of methods have been utilized in clinical cases.

I would like to introduce the new method of biomagnetic effects and low power laser effect for pain relief in my laboratory. To conduct research on biomagnetic effects, a rotating magnetic generator had been constructed. The magnetic units are attached on the plate which can be rotated by a motor. The biomagnetic effects were experienced in the pain patients of orthopaedic diseases and positive results were obtained. In positive cases, the increase of the surface temperature could be approved by thermography.

Low power laser means less than 10 mW with a non-thermal effect which activates biochemical substance and stimulates biological tissues. For this purpose, He-Ne diode, Nd-YAG and argon lasers were used. In the biostimulation effect, wound healing, pain relief, laser acupuncture, and antiphlogistic effects were approved. In order to study the biostimulation effects of low power laser, diode laser units were constructed with a 60 mW, pulse mode and double blind tests were carried out on 200 cases of orthopaedic and neurologic patients with pain. In group A, using the diode laser, the effective ratio is 83%, however the non-effective ratio is 17%. In group B, that is the control group without laser irradiation, the effective ratio of 56% and the non-effective ratio is 43% was found. These interesting results were revealed on the following day of the biostimulation. In group A, the effective ratio did not change. However, in group B, the effective ratio decreased from 56% to 40%. This is a significant result. Dr Oyamada tried to show low power He-Ne laser effects on rheumatic arthritis utilizing a double blind test. In the results, the effective ratios are 78-80%, placebo effects are 22-31%.

The essential mechanism of biostimulation effects by low power laser can not be clarified at present. However, I feel that "Hemeostasis" mechanism may play a large role in biostimulation effects.

Medical Ethics in Pain Treatment

The two important missions of the physician are to alleviate human suffering and to preserve human life. In the treatment of cancer patients, these two objectives are conflicting with each other in promoting a more liberal use of addictive drugs in the hospice and diminishing drug utilization for narcotics addiction.

For medical ethics, the following principles are important: autonomy, non-maleficence, beneficence, justice, veracity and confidentiality. These principles are based upon Western morals but increasingly appearing in Japan. In terms of autonomy, informed consent is very important in the Japanese medical community. Non-maleficence is a universal principle and confidentiality has recently become an essential ethic there.

In their practice, physicians are usually confronted with numerous ethical dilemmas and in such cases, decision making by ethical reasoning is necessary. For this purpose, several methods as described by Dr Harron are essential for this purpose which include analyzing, weighing, justifying, choosing and evaluating.

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PAIN AND ECONOMY

Dr P. GEERTS

Introduction

Pain is still one of the most common and least understood of all the ailments that mankind has to contend with. That also makes it one of the most challenging problems in medicine. A challenge to the sufferer, to the doctor, to the scientist, and to society. Society, for instance, is expected to find the financial resources to relieve or prevent pain and suffering as much as possible.

It is not uncommon to hear patients who suffer severe pain stating that they would do or try just about anything to relieve or even alleviate the pain they experience. A look at the economic consequences of such an obnoxious state thus seems quite appropriate at a seminar that investigates the complex interaction between pain and society.

General data

Epidemiology

Most people are only too familiar with the experience of pain, and three or four different pain sensations per year are the common average. The Nuprin Pain report⁽¹⁴⁾, is a study on pain in the USA that was performed in 1985. It was found that headaches are the most common kind of pain, and that 73% of Americans suffer from one or more headaches in a year. The incidence of backaches, muscle pains and joint pains were found to be 56%, 53% and 51% respectively. This listing already indicates that the problem is not uniform: many people suffer, although often only occasionally, from multiple pains.

Other epidemiological studies include a postal survey of 1,009 individuals in Sweden, where the most frequent pains found were situated in the lower back and shoulders⁽¹⁰⁾, and a survey among 1,265 adults enrolled in a large health maintenance organisation in Seattle, where the highest incidences noted were back pain and headache⁽²⁷⁾.

This listing, although comprehensive, does not give the entire picture. Some of the more severe types of pain are not listed, such as pain at childbirth or as a consequence of malignant cancer. Severe pain is experienced by approximately 70% of people suffering from advanced cancer.

Migraine, a specific type of headache, is supposed to inflict pain in 3 to 29% of the population⁽¹⁸⁾, but 5% seems a more reasonable average figure. These varying figures are the result of diagnostic problems, differences in definitions and, perhaps, an as yet undiscovered variance in the actual incidence. Furthermore, studies have pointed out that up to a half of the patients with pain problems never consult their doctors about it⁽⁴⁾.

General cost to society

Again according to the Nuprin Pain report, an estimated 4 billion sick days were lost in the US alone in one year. This means approximately 23 days per person per year. Among the full-time working population, 5 days per person or a total of 550 million days were lost. In another report, the Panel of Pain estimated in 1979 that chronic pain syndromes cost the US economy 40 to 50 billion dollars annually⁽¹³⁾. John J Bonica, pioneer of pain treatment, also published interesting data on pain prevalence and its economic consequences. In a 1987 article, he estimated that in the US, 702 million work days are lost annually to chronic pain, representing a \$67 billion drain on the economy⁽⁹⁾.

Chronic pain in general is the third largest economic medical problem, after cancer and cardiovascular disease.

Migraine

As mentioned above, many patients never consult their doctors about their recurrent headaches. This is a typical example of the "iceberg" phenomenon, in which only a small fraction of the real incidence of a certain disease is actually known to the medical profession. Self-medication, or simply accepting the pain as an unavoidable fact, was and is how the majority of the patients deal with the problem. Sick leave from work or non-attendance at school on account of migraine is frequently blamed on stomach complaints, as patients avoid to divulge the true nature of their prodromal phenomena. This is the fear of being labelled as a "mental case" or a "weakling" if one stays at home simply on account of having a "bit of a headache"⁽⁴⁾.

Bonica mentions 136 million lost work days and a cost to society of \$9 billion in the US. A survey conducted among 15,000 workers by the British Migraine Trust in 1977 found that 17% of the men and 21% of the women stayed away from work for 3 to 5 days each year on account of headache attacks. Even more remarkable was that only 35% of the men and 43% of the women had actually informed their employer that migraine was the reason for their sick leave. Another sign that a migraine sufferer does not like to advertise his or her complaint.

Occupational Pain

Back pain

Back pain is an extremely common ailment, and the most classic example of occupational pain. It certainly is the most common cause of compensation payments in the US, and is among the most expensive and costly disabilities. Bonica estimates that 220 million work days are lost to chronic back pain every year, nearly one third of the total lost days due to chronic pain, and thereby the greatest source of absenteeism in the US. The cost to society, he estimates, is in the order of \$23 billion.

In a publication of the Department of Health Economics⁽²⁸⁾, UK, the cost of back pain is studied in detail and was calculated to be £156 million in 1982. Beginning at the primary care level, the condition accounts for 2.6% of the general practice workload, thereby generating an estimated expense of £26 million. If it is assumed that each consultation with a general practitioner for back pain results in a prescription for 4 weeks' medication, and if dispensing fees for pharmacists are taken into account, the bill for pharmaceutical services amounts to £39 million. An average of 15% of people consulting a GP for back pain are referred for specialist opinion, incurring a cost of £25 million in Outpatient Consultations. Based on the number of discharges for back pain and the average daily inpatient cost to hospitals, an expenditure of £66 million can again be added. The total cost of back pain, therefore, was equivalent to 1.15% of total NHS spending in 1982.

The economic ramifications are obviously not limited to NHS expenses. The acute discomfort and immobility also result in a substantial volume of absence from work. In Britain, 33 million days of certified incapacity is the yearly price paid for back pain. This represents 9.2% of all certified days of absence, more than 6 times the amount of days lost to industrial stoppages. On the basis of average levels of remuneration, the UK was deprived of £1,018 million of output. These incapacities also resulted in £193 million worth of benefit payment from the social security fund.

These staggering figures are borne out wherever they are calculated. In Canada for instance, the overall 1-year incidence was 1.37%⁽¹⁾. In the one-year follow-up, 74% of the workers were absent for less than one month. However, the 7.4% of cases who were absent from work for more than 6 months accounted for nearly 75% of lost days, medical costs and indemnity payments. In the UK, annual absence from back pain was 1,323 days per 1,000 employees⁽³⁾. A US study mentions 1,400 days of work lost per 1,000 workers. Many other studies reflect this grim picture^{(7), (11), (19), (22)}.

Indeed, the tragedy also lies in the fact that it is a condition brought about, in part, by the type of job people do. Some of the most prone employments are: nurses⁽⁶⁾ (1.3% who quit give back pain as the reason⁽²⁶⁾), with 750,000 working days lost annually in the UK⁽²⁸⁾, others include paramedical staff (87% in a Canadian study)⁽²¹⁾. It was also found that drivers (69%)⁽¹²⁾, and coal miners (66%) were badly affected.

Other occupational pain

Low back pain is far from being the only pain resulting from working conditions. One should also mention the "carpal tunnel syndrome" of supermarket checkers⁽²⁰⁾, shoulder pain syndromes in shipyard welders and steel platemakers⁽¹⁶⁾, chest pain in glass bottle makers and neck pain in bus drivers⁽²⁹⁾.

Arthrosis

Part of the arthrosis problems are obviously included in the back pain data, but separate data merit investigation. In a series of prevalence studies in the UK, 11% of manual workers had diagnosable osteoarthritis of the limbs, 2% had general osteoarthritis, and 11% had vague pains in the limb joints⁽²⁾. Annual sickness absence was 580 days per 100 affected men for those with local osteoarthritis and 539 and 80 days per 100 workers respectively for the other categories. Bonica estimates painful arthritis to cause 220 million lost work days annually in the US, causing a dollar loss of \$17 billion.

Cancer

Pain is an extremely prevalent symptom in patients with cancer. Overall, pain is reported by about 50% of patients at all stages of the disease and by over 70% with advanced neoplasms⁽²³⁾. This means that 297,000 patients dying of cancer in the US and 1,027,000 cancer patients who survived in the year 1983 had pain. Extrapolating these figures to a worldwide scale, this implies that 3 of the 4.3 million patients who died from cancer and 16 million of the surviving patients, experienced cancer-related pain in 1984, a staggering total of 19 million people. Bonica stresses that it must be remembered that most cancer patients suffer from more than one type of pain. He estimates the yearly cost to the US economy to be of the order of \$0.5 billion.

Of course, the sociological cost to these patients and their immediate surroundings is greater than for other types of pain.

Other Types of Pain

While the above details give the most obvious and common pain types and their results on the economy at large, it is far from being a complete list. Let us consider for instance neurological pain, cardiac and visceral pain, orofacial pain. Bonica estimates the cost to the US to be in the order of 150 million work days and \$15 billion. Consider the pain in and around surgery and childbirth. A survey among anaesthesiologists showed that they treated, on an average basis, 109 patients per 4 weeks for operative pain, 84 for postoperative pain and 15 for pain associated with childbirth.

Research on Pain Relief

Needless to say that pain has inspired many scientists to explore better ways to relieve it. Pharmaprojects, a pharmaceutical industry publication on drugs in research, lists 62 narcotic analgesics in research or development in different stages, 128 non-narcotic analgesics, 29 migraine preparations, 5 enkephalin-like compounds, 205 anti-inflammatory drugs, 9 anti-gout substances, 97 anti-rheumatics and 20 topical anti-inflammatories⁽⁶⁾. Current estimates of the cost of developing a new drug vary between \$100 million to \$125 million. This implies that the lion's share of financial resources committed to pain relief is being provided by pharmaceutical corporations.

Pharmaceutical Market

All this research activity has resulted in continuous progress in terms of therapeutic modalities. It has also inevitably led to a highly competitive analgesic market. Frost & Sullivan Inc, pharmaceutical brokers, list pain relief as the number one area for new product development, especially in the over-the-counter market⁽²⁴⁾.

Worldwide, the analgesics (narcotics, non-narcotics and migraine preparations) account for 3.5% of the \$104 billion ethical pharmaceutical market⁽³⁾. 46% of this analgesic market is found in the USA, 35% in Europe and only a surprising 13% in Africa/Australasia. Considering that Japan, which is included in this 13%, is one of the largest pharmaceutical markets in the world, we may conclude that pain is not a predominant entity in Japan. The analgesic market represents 5% of the total pharmaceutical market in the US, 3% in Germany, 4.4% in France, 2.1% in Italy, 5% in the UK and only 0.7% in Japan. 93% of the \$3.8 billion market is concentrated in the retail as opposed to the hospital sector. It has been found that 1,602 companies sell 3,263 products, and this only represents the 20 countries followed up by IMS (International Medical Statistics)⁽⁵⁾. The largest number of companies and products are to be found in the segment of the non-narcotic analgesics: 1,154 and 2,233 respectively.

The price paid for by the patient differs of course from country to country and from product to product. Average cost for all varieties of analgesics is \$0.1 in the US, \$0.28 in France, \$0.38 in Japan, \$0.09 in Brazil and \$0.19 in Belgium. Liquid forms tend to be more expensive than tablets, and injectables more expensive than liquids.

Between products, price competition is fierce, sometimes escalating in full-blown price wars. The average price per tablet of the two best-selling products in a given category can be quite similar, as in the case of Tylenol (\$0.083) and Advil (\$0.092) in the non-narcotic analgesics in the US. On the other hand, there can be an enormous difference in prices such as in the case of Aspirina (Pst 7) and Nolotil (Pst 25) in Spain.

Cost Reduction

In view of the immense consumption of analgesics in the industrialized world, it is not surprising that a sizeable effort is being made to restrict the impact of treatment cost in various ways. Hospice treatment and home care for terminal cancer patients, Patient Controlled Analgesia in postoperative pain, biofeedback and relaxation training, ergonomics, specialized psychiatric and psychological programmes⁽¹⁷⁾, diagnostic software⁽¹⁵⁾, posture training and education, electronic pain suppression devices such as Transcutaneous Nerve Stimulation (also used in dentistry), homeopathy; all have been presented at one time or another as cost-saving solutions in certain instances of pain relief.

Conclusion

Pain is a major drain on society and on the economy, in various ways. Much remains to be done to adequately alleviate this scourge on humanity, and to do so in the most cost-efficient way. This should however never take the form of cost-saving for its own sake, because the human aspect of pain should always prevail.

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THE ROLE OF PAIN IN THE TRADITIONAL DISCIPLINE OF BUDDHIST PRIESTS AND SAMURAI

Professor Dr M. OKAMOTO

I remember something that made a great impression on me, when I was a medical student. A professor explained that some of the fingers of patients suffering from Hansen's disease are unusually short because their cutaneous sensations are so terribly affected by this disease that they cannot perceive any external pain. In actual fact, extremes of temperature, whether hot or cold, will result in a sensation of pain, in a cutaneous sense as in the case of touch or pressure. It is probable that this sensory mechanism contributes to the protection of the individual body so that the sense of pain is a kind of fortress for the human body.

What is the effect of pain on the human mind? It is well known that the cerebral cortex is composed of many different areas which have their own different functions, and that these areas grow as they receive stimulation from inside and outside the brain. The optical area, for example, situated at the occipital pole of the brain, grows as light comes into the eyes, while the auditory area, located on the top surface of the lateral lobe, grows then sounds enter the ears. Where is the human mind? There is still no definite answer to this fascinating problem which has challenged mankind since ancient times.

We, as scientists, believe that the mind, at least, will be somewhere in the brain. But, where is the brain? Though, in the past, the pineal body and the brain cavity were taken as the site of the mind, we now tend to think of the cerebral cortex as a more likely location. This brings us to the question, where in the cerebral cortex? Is the mind dispersed all over the cerebral cortex or concentrated in one definite centre?

Analysis of various types of brain damage in the past 150 years of neurology has suggested that the mind is probably to be found in the frontal area of the frontal lobe, or so-called prefrontal area. This fact has recently been verified with increasing certainty by non-invasive imaging methods like PET and MRI. Anatomical and physiological investigations have proved that the prefrontal area is the highest level integration centre. The intended movement is initiated here in accordance with the integration of the different kinds of sensory stimuli. The intention of movement is organised into a programme in the premotor area, just behind the prefrontal area. The programme of the movement is then projected to the motor area, from whence discrete movements are elicited. The prefrontal area can thus be regarded as the place where our will is initiated, or in other words, as the centre of ourselves.

What stimulation is appropriate to promote the growth of this area? As the sensory integration centre, the area grows more rapidly when it receives sensations from the body, including the sense of pain. The sense of pain, here, includes pain in its wider significance of spiritual pain as well as physical pain. For this reason, the growth of this area is strongly influenced by such factors as state of mind, mental resistance to

spiritual pain and efforts to avoid the pain which is part of human existence in this world.

Anatomically and physiologically, this area has been proved to grow rapidly between the ages of 3 and 4 and 7 and 8, and to continue to grow gradually thereafter. The ages of rapid growth of this area correspond well to the rebellious periods in a child's development when the child begins to assert him or herself. It is external resistance to such self-assertion that generally constitutes the basic stimulation to these areas. Such resistance allows the "self" or the individuality of a human being to be formed gradually.

All over the world, when we talk about the discipline of children, particular attention is focused on the "rebellious" ages of 3 and 4 and 7 and 8. The biographies of famous inventors and discoverers often reveal that these men suffered a painful experience at an early age. In this connection, Newton and Einstein come to mind. All human achievement may be said to depend upon the development of a firm personality in the early stages of life.

Looked at from this point of view, what relevance does this world, based on technological civilization, have for the establishment of personality? Although I myself recognise the important and tremendous contribution which technology has made to human welfare, I cannot help reflecting on the negative side of such a technology-oriented civilization.

It appears to me that this world teaches us, basically, simply to try to avoid pain and seek comfort. As a result, some functions of the human body seem to have been degraded. These physical effects can be observed in the younger generation of Japanese, who also have a tendency, often, to give in easily to temptation and not to grapple with the difficulties in their lives. Recently, there has been much anxiety among parents and teachers about the future of these young Japanese. The National Council for Educational Reform, organised for the last three years by the Japanese Government and of which I am Chairman, was held as a direct result of such anxiety.

Foreigners have also pointed out that young people in Japan are of a different quality, physically and mentally, from the Japanese at the time of the Meiji Restoration or the Japanese who worked to reconstruct their country from the nadir of poverty after World War II. Those who succeeded in bringing off the Meiji Restoration and who accomplished Japan's modernisation were of the same stock as the people who lived for 300 years under the feudal rule of the Tokugawas. The Japanese of these days seem generally to have found their spiritual support in Bushido or chivalry, the way of the Samurai or warrior. Of course, modern Japan rejected feudalism and the privileged militarism of the Samurai, but Bushido could still be used to represent the mental essence of oriental cultures such as Shintoism, Buddhism and Confucianism.

According to the famous book entitled "Bushido, the Soul of the Japanese", written by Professor Inazo Nitobe, an important scholar in the Meiji Era, the Samurai was disciplined by virtues such as justice, courage, etiquette, fidelity, honour, humanity and commiseration. These Samurai received severe physical and mental training from between the age of 5-6 onwards. On the physical side they were required to learn 18 kinds of martial arts including kendo (swordmanship) and judo as well as kyudo (archery), kido (horse riding) and sojutsu (spear manipulation), while the mental part of their training involved the study of the nine Chinese classics, in addition to sado (tea ceremony), kado (flower arrangement), the writing of poetry and calligraphy. One of the eminent figures trained according to the Bushido code was Yukichi Fukuzawa, who pioneered the new developments in Japanese civilization at the time of the Meiji Restoration and who founded Keio University.

The training of the Samurai aimed to teach him to overcome pain in life, to control the self and, ultimately, not to fear death. The Samurai has to regard life and death as two sides of the same coin. The Imperial Rescript on Education of the Meiji Emperor, which guided the entire course of Japanese education from 1890 to the end of World War II, contained all the virtues of the Bushido code. In this way, the Bushido spirit survived till the end of World War II. This rescript was abolished in 1946, on the advice of the American Education Mission, in order to eliminate excesses of Japanese nationalism and militarism.

Once again, the essence of the training received by the Samurai taught him to overcome pain in life and to look upon life and death as not separate but as one and the same thing. The essential part of this training, for the same purpose, is still performed by priests in a Buddhist temple in Kyoto where I live. Allow me to tell you a story of this training in a little more detail in order to show how pain, after forming a fortress for physical and mental individuality, will result, in its extreme and ultimate phase, in a state in which the mind wants to separate from the individual in order to unite with nature and to entrust itself to Buddha.

To the north-east of the city of Kyoto, there is a small mountain called Hieizan, which is about 500 metres above sea level. On this mountain, there is a temple named the Enryakuji, constructed by a young, but already renowned, priest called Saicho in 785 A.D. The Enryakuji has an attached mental training facility for younger priests in which Zen meditation is practised. In addition to Zen meditation, one of the most severe training disciplines of all, the "Sen-nich kaiho", which translates literally as "wandering the mountain tops for a thousand days", is also practised. This type of training is also called "walking Zen meditation". Since its founding, Hieizan has allowed no more than 45 trainees to endure this extremely demanding practice. These 45 successful priests obtained the title of "ajari" and are respected in both ecclesiastical and secular worlds as very distinguished priests. Before embarking on the "Sen-nichi kaiho", a priest or monk must have proved himself in a preliminary test called "hyaku-nichi kaijo" or "wandering the mountain tops for a hundred days" and obtained the permission of the Council of the temple. This test examines the physical and mental health of the monk. The monk is dressed in white like a dead person and has no footwear other than straw sandals. The main items in the luggage carried by the monk are a "shide himo" or string for hanging himself, and a dagger for suicide. The monk wears a hat made of the leaves

of the lotus, the plant on which the historical Buddha, Shakyamuni, is believed to have sat. A rokumon sen, an ancient coin corresponding to about six pence, is fastened at the base of the hat strings. This coin is believed to cover the amount of money to be paid for transport by ferryboat on the River Three Ways - like the River Styx in Greek mythology which was believed to flow between this world and eternity.

The monk leaves his quarters at midnight and walks 30 kms in one day on steep, craggy, grass grown paths on the Hieizan mountain, reciting sutras as he goes. In addition, he holds a religious service at 6 o'clock in the morning and in the evening. Hieizan represents the boundary dividing Kyoto and Shiga prefectures and its northern face looks out on Lake Biwa, the biggest lake in Japan. The monk is buffeted by high winds, he has to endure freezing cold and his chapped feet in the straw sandals bleed. After 700 days in the mountains, the monk undergoes the most demanding ascesis of all call "doiri". This is a real trial which requires the monk to be ready for death. Prior to the beginning of this ascesis, the monk's superiors, colleagues, parents and acquaintances gather in order to hold a farewell ceremony for him. He recites a sutra a hundred thousand times per day in a small temple called a "fudo-do". This ascesis continues for nine days during which the monk cannot eat, drink, sleep or lie down, and he must go to a well located at a distance of 200 metres from the fudo-do and bring back water for Buddha regularly at 2, 5 and 10 o'clock in the morning.

With the passing of time, the monk's perception becomes more and more transparent. In the first days of the ascesis, his mind tends to be dominated by the idea of managing to survive and get through the training. While he is reciting sutras, he wishes time would pass more quickly. However, gradually, the monk begins to feel that it is something or someone outside of himself which permits him to live and the recital of sutras has a calming influence on his mind, as he comes to feel that he is totally trusted by this "something" or "someone".

This is a spiritual experience, but can it be called enlightenment? The weight of the candidate was reduced from 58 to 42 kg.

Monks who have achieved this ascesis have the privilege to enter through the gate of the Imperial Palace in Kyoto wearing straw sandals (dosoku san-nai) in order to pray for the peace and welfare of the Emperor in the Grand Hall where once an Imperial Conference was held for the Meiji Restoration. Both the training of Samurai and the ascesis of Zen monks aim to produce the feeling, by facing death voluntarily, or experiencing the ultimate phase of pain, that one's self is living in accord and alone with the great powers of nature where life and death are one and where there is no difference between these two states of existence.

Thus pain plays an important role in establishing physically and spiritually the individuality of a human being. In this sense, it is difficult to establish individuality in the midst of modern civilization. On the other hand, if a human being faces death, the ultimate phase of pain, he or she probably has a sense of oneness with nature which transcends human individuality.

I wanted to let you know that this kind of training still holds a strong attraction for many Japanese in our highly industrialised society. The Japanese are now living in economically affluent conditions which have been achieved by promoting a civilization based on science and technology. At the same time, however, they try not to forget the traditional ways of discipline in their history up to the Meiji Era and beyond, which enabled the modernisation of their country to succeed and brought Japan to its present state of prosperity. It is surely significant that the pictures of Yukichi Fukuzawa, who promoted the westernisation of Japan and founded Keio University, Inazo Nitobe, who wrote "Bushido" and Soseki Natsume, a Japanese writer who suffered "terrible agony" in trying to bring about a fusion between western and eastern cultures should now appear on ¥ 10,000, ¥ 5,000 and ¥ 1,000 notes respectively.

SESSION 3 RAPPORTEUR'S STATEMENT

Professor Dr U. GERHARDT

As far as I could see, the topic of societal aspects of pain was mainly dealt with under the perspective of culture. The three papers looked not so much at social organization. It was the aspect of culture that was seen as the most important side of societal interpretation of pain.

I found that there were three different aspects of this problem that were addressed in the various presentations this morning and also mentioned in the discussion. I shall briefly try to summarise them.

The first aspect was explanation. Professor Atsumi made it clear that in different cultures of Western and Japanese origin over the ages there were different explanations of pain related to the therapy given. It was most interesting to hear, for instance, that in ancient India pain was denied, that is, it was dealt with by not recognizing it. This meant that no explanation of pain could be given since no diagnosis of pain was made, but also no therapy of pain existed.

In other cultures, particularly in the Westernized cultures, a wide range of explanations of pain is related to a broad scope of therapies for pain. There are also numerous diagnoses of pain which, as experienced by the patient, may be painful or not. Professor Atsumi explained how he combines the Japanese and Westernized approach in his own work. He diagnoses pain through thermography which is not painful, and he attempts to alleviate it through bio-feedback and laser techniques. His diagnostic attitude owes much to Japanese cultural explanation of pain, and his therapeutic work adapts Western tendencies to alleviate rather than endure pain.

The second topic was the incidence of pain which is different in Eastern and Western cultures. The indicator is the use of pain medication which is also culturally different. Dr Geerts in his presentation on Pain and Economy addressed the issue of the price paid for pain, in terms of money spent for pain medication but also days lost in industrial production and other sectors of the economy.

Implicit in this presentation was the question whether it is permissible to speak of excessive sensation of pain causing excessive use of pain medication or therapy. Could the number of work days lost due to pain (e.g. back pain or headaches) be reduced if people were less sensitive to the small aches of everyday life? Or does modern society with its stresses and strains increase the amount of pain felt by people? In this case, traditional society could be said to engender less pain than modern life-styles.

The third aspect of the societal side of pain in terms of culture was that of the benefit of pain for the development of personality. Professor Okamoto in his challenging presentation mentioned the hypothesis that pain is a hardener of personality. This standpoint is radically different from the Western perspective where pain is regarded less favourably than in traditional Japanese culture.

In the discussion, the issue raised by Professor Okamoto was taken up by various participants. It was maintained that the unification of body and spirit brought about by pain might be lost through the introduction of Western techniques and culture into the Japanese society. It was also held that chronic pain as treated by modern doctors in Western societies may be suffered by people who were abused or beaten in their childhood. Therefore, pain for them ought to be seen not as something positive that helps to develop their personalities but as something negative where suffering destroys the humanity of the sufferer. As a concluding point, I feel that love and compassion could help to develop personalities just as much as pain does. But, to be sure, this may be a Western way to look at things.

SESSION 4

CONCLUSIONS

PUBLIC PERCEPTION OF PAIN

Mr H. YAMAMURO

The study of pain is obviously a recurring topic amongst medical professionals, but it seems to be rare for so many people from various fields to participate and exchange opinions on the subject of pain in a gathering such as this.

To consider the public perception of pain as a subject for debate would hardly arise in such a homogeneous country such as Japan. Perhaps this is because the Japanese believe that the pain of each individual can be understood easily by others. At the same time, since fortitude has traditionally been a Japanese virtue, common Japanese other than medical professionals have had a lack of experience in the serious study of pain.

The Japanese Emperor died of duodenal carcinoma at 87 years of age on 7 January 1989, yet he had rarely displayed pain over the period of one year and three months or so after he had a related operation in September 1987. This is a story that I heard from the court physician of the Emperor. Though he took effective measures to remove the pain, it cannot be denied that the Emperor was also a man of fortitude a traditional type of Japanese. It seems the Emperor simply followed the Japanese custom according to which it was not good manners to show one's emotions.

Recently, however, Japanese society has become increasingly complicated, and the sense of pain seems to have become diversified, depending upon differences in generations, political and economic situations, as well as more individual-oriented attitudes towards life styles. Although this may sound very simplistic, I believe there are some obvious features we recognize about pain. The first is the fact that pain is very personal. Regardless of whether it is a physical, psychological or mental pain, it is a personal matter. Some people are sensitive while others are less. The personal difference in pain is also great, as it is totally subjective. Above all, this is a matter of fortitude or personal difference in the limit of fortitude. The second point is that pain can hardly be measured quantitatively. Here, various studies have also been made, but true data still remains undiscovered. Namely, this is a question of whether the quality and quantity of a pain can be measured with a machine to objectively express it in terms of numeric values and symbols. I think this is a great question for the future.

Considering the above points, the question of pain causes me to recall the "solipsism" of philosophy; i.e., what other people are thinking cannot exactly be known absolutely. One's own thoughts can be known by oneself only. If I remain tied to solipsism, however, I cannot discuss anything about the public perception on pain. Let me then try to look for some common clue in pain. In Europe, particularly in the Christian world, there is the Holy Communion. I think this means to own God in common as is apparent from the term "communion". So, communication means a communion of information. Ex-communication means an exile from the same circle. This is also the same in the Islamic, Judaic, Hindu, Buddhist, and most other religions outside of Christianity. A public perception of their respective God can be assumed to exist among different believers. No entity could have lived from ancient times through the medieval

ages unless it had "mutual support". I think religions have played a key role in this mutual support, along with mythology and folk tales.

Modernism, however, seems to have broken up this system. Modernism means individualism. Namely, the fact that we made the public perception on pain an issue suggests that pain is a product of modern society. Looking at this more precisely, although modernism might have enabled men to live alone and although modernism meant a fight towards individualism, I wonder about the current phenomenon of returning to the mutual support concept of no man being able to live apart, which has only now begun to appear again. Namely, I think that in today's status quo we find both commensalism and individualism coexisting.

Let me try to be more specific. Although this is more a matter of current affairs and politics, until now Japan has been criticized for being fairly behind in the international campaigns on the problems of racial discrimination in South Africa and Palestine. However, in South Africa with the names of Nelson Mandela and Bishop Tutu now internationally known, Japan has begun to show an interest in apartheid. Similarly, regarding the issue of more than 2,000 so-called Chinese and Vietnamese "economic refugees" who came to Japan as boat people over the past month of August 1989, 80% of the Japanese when asked responded that they should not be permitted entry into Japan, while 20% expressed the opinion that their entry should be permitted on humanitarian grounds and the realistic notion that this would benefit the labour force, thus pitting opinions against one another. In my opinion, this is quite different from the recent exodus from East to West Germany, yet the Japanese are now suffering from thoughts on how to treat these economical refugees, in comparison to the situation in Western Europe.

Furthermore, I believe that the problems of environmental pollution on and around the earth are also now a question of pain common to mankind. And if I am to talk about the theme of the "public perception on pain", I think that I cannot help touching on the problem of "inequality and poverty". That is to say, I personally believe that it is now necessary to recognize and publicize the basic idea of the Rome Club, i.e., the idea that "we, one world of five billion people, are now riding on a small boat or spaceship called the earth." Whether this ship is made to sail safely or sink is a matter of decision to be made by ourselves.

In approaching this theme of the "public perception on pain", I think it is necessary to divide the topic into parts. First, in looking at the world at large, it still remains impossible for various nations and citizens to commonly share a 100% perception of each other's pain. We must, therefore, begin to create a new philosophy, i.e. a new sense of community and new practices. Today I believe we are standing at this gate, and what we have to pay special attention to hereafter is not to demand a perfect agreement among us, but to be satisfied if an 80% agreement could successfully be achieved.

The idea that we will not be satisfied unless a 100% perfect agreement is reached will contrarily intensify friction and opposition. This seems to me a condition for mankind to coexist peacefully and, for this, we have to produce better "habits".

For example, today, many countries are cooperating to work actively with regards to the stabilization of major international currencies through the mechanism provided by G5 and G7 meetings. This is what is called "coordinated policy intervention". In the past it was, of course, known that this kind of method was a good one in terms of logic and reason, but until the time when the currencies of major nations were shifted from the fixed exchange rate system to the floating rate system, each country was thinking of this question in terms of infringement of national sovereignty and interference in its internal affairs.

Now, however, no one speaks of such coordinated intervention as interference in the internal affairs of the countries involved, for it is now widely understood that international co-operation is the most important thing. This kind of thinking has now become a reality. Put another way, countries can no longer survive alone by themselves, especially in the realm of currency and finance. This theme, moreover, must be tackled by pragmatic means, rather than romantic ones.

Lastly, I would like to close my presentation with a statement by Charles Sanders Peirce, an American mathematician and philosopher, who said that "the formation of faith means nothing but establishing the habits".

CONCLUSION OF THE CONFERENCE : RAPPORTEUR'S CLOSING SUMMARY

Professor G.R. DUNSTAN

At the end of our Colloquium I try to link together a few themes from what has been given us in the full sessions, without, I hope, losing my way or misleading you with too much detail. I have selected five themes, on each of which I shall say a little.

First: we have had conflicting views expressed on the value and function of pain. We shall not reconcile, or even recognize these unless we distinguish the sorts of pain we are talking about.

Obviously, there is a protective function in pain, to warn us, either of an external threat to the body - too much heat, or sunlight, perhaps - or of some internal disorder, some bodily function or organ that is going wrong. We should be at greater risk without this capacity to feel protective pain.

There is also, the pain inherent in human effort : when we stretch ourselves to climb rocks or mountains, to run or swim at high speed, or to take vigorous exercise on long walks. We need this exhilarating function of pain if we are not to grow soft, if our bodies and minds are to be kept in good working order.

Both of these functions of pain have positive value.

There is, thirdly, pathological pain, either pain suffered because of severe bodily lesion or trauma; or pain imposed in punishment or torture or cruelty or abuse, even by self-torture; or, as Professor Yamamuro said, wherever political or economic forces impose misery on the poor, on refugees and the like.

The claims for spiritual value made for pain of this sort are seriously disputed. Professor Gybels drew on much clinical experience to cast strong doubt on those claims; and this doubt was echoed again from the floor this morning. No doubt, religions, Eastern and Western, attribute spiritual value to pain, though without always specifying to what sort of pain they allude. And undoubtedly those same religions forbid us to inflict torture and unnecessary pain on others. They command us, in the name of compassion, to relieve pain when we can.

My second theme concerns the ethics of medicine in a shrinking world. A speaker yesterday said that Japan is now accepting Western objectivity in place of its native subjectivity, the more rapidly as Buddhism decays as a cultural force. He asked, is impersonality a necessary consequence of modern medical technology ?

I suggest another approach. Japan, like all ancient civilizations and cultures, has its traditional ethics of medical practice. But as Western medical technology has spread, so also has what I may call the Hippocratic tradition of ethics spread with it. Japan, like many other nations, accepts the principles of the Helsinki Declaration on Medical Association, because they appeal to the natural humane moral sense or reason to which Professor Ashizu referred yesterday. It was Japanese initiative which placed the ethics of medical research on the agenda for the Conference of the Summit Nations on Bioethics held in Ottawa in 1986.

We have common ground on which to face the ethical challenges of modern medical technology together, and in so doing to restore trust in medical research and practice, while subjecting both to ethical control. This common ground is too little known. We should make it better known.

My third theme is Technology and the Person in the Control of Pain and in Terminal Care. May I suggest that we are now moving into a post-technical age of medical care? That we have now passed through a time when technology threatened to become our master, wonderful as it was in the new possibilities which it gave us? That we are now developing new attitudes to pain control units in Britain and elsewhere doctors and nurses use all that modern pharmacology (as well as clinical neurology and psychology) can give; but they use it to make the life and dying of the patient as personal a matter as possible. Analgesics, anxiolytic and anti-emetic drugs, and the like, are titrated and administered, not to blot out the pain by blotting out the patient, but to free the patient for the consummation or fulfilment of personal relationships, so far as may be, as part of the personal activity of dying.

Even more importantly, these skills are not confined to within hospices and special units; they are being taught, first to consultants and doctors in the Medical Schools and teaching hospitals, and then to medical students themselves. A new generation of doctors is growing up, in hospitals and in general (family) practice, more skilled in understanding pain as a personal experience, and in controlling pain (not merely in relieving it) - controlling it in advance, leaving body and spirit in comparative peace. They are learning to do this now, without the groundless ancestral fear of dependence on or addiction to opiate narcotics.

The education of doctors was discussed yesterday. This education must be undertaken more extensively. But new understandings and new skills give us something new well worth teaching. For this we are indebted to the neurologists, pharmacologists and psychiatrists who have given us tools to use, not techniques to dominate or destroy the person. Once more, we have good ground on which to restore trust between the doctor, the patient, and the patient's family. But the doctors and scientists themselves must take the initiative, and teach. Doctors must, of course, keep their knowledge up to date. We all know the danger of relying on what we learned or were taught many years ago. In these areas of medical science and practice old hypotheses are soon out of date. New ones must be tested, by rigorous trial. The art of medicine persists while the science of it must change continually.

My fourth theme is a defense of research and innovative practice. Not much has been said of this, except with reference to the use of animals in exploring nerve pathways and cerebral responses, the action of endogenous anti-nociceptors (like the endorphins) and the testing of new pharmaceutical syntheses.

The champions of animal welfare have their justification in a long history of insensitive practice: Cartesian mechanism made living animals its most tortured victim. Unnecessary suffering is inflicted on animals still. Yet progress is being made in regulating the use of animals in medical research in ways which restrict closely the suffering which may be inflicted on animals, while permitting legitimate research, fundamental as well as goal-directed or applied. There is now a European Convention, mandatory under the Commission, with guidelines to be observed; national governments are obliged to conform their laws to it. In the United Kingdom we have a new Animals (Scientific Procedures) Act 1987, with strict statutory controls; and they are applied. Canada and the USA are moving in the same direction.

Yet there is much to be done, especially in reducing the demands made by national regulatory bodies for pharmaceutical and other products, which require standards of safety, and therefore testing on animals in vivo, far beyond practical necessity. More progress must be made in replacing animals, so far as possible, by tissue culture and other means now being developed in scope and in their degree of accuracy and refinement.

The other major threat to research and innovative practice comes from "Pro-Life" groups and civil rights activists, who see threats to human rights in many areas of useful research and development. Their fears centre chiefly on embryology and the use of fetal neural tissue. They even invent "rights" where none exist - in any definable sense of the word "right". Some of these groups claim the authority of religion for their stance. It is, therefore, necessary for us to assert again today that research, free enquiry, the search for the truth of things in a proper exercise of rational human nature; an inherent liberty of man. It becomes a duty to use the knowledge so gained to serve the human interest, in the conquest of disease and the remedying of pain. That liberty and that duty must be exercised, by just and fair means, in a free society; only when the interests of other persons, or of the common good in society itself, are threatened, is restriction by the state legitimate.

My last theme, therefore, is The Individual and the Community. We have heard once or twice, in the Colloquium, reflections on Western individualism which has invaded the traditional societies of the East, traditionally strong in their corporate sense. We heard, in the last paper, Mr Yamamuro plead for the restoration of community to our world. The point is well made, and well taken.

Pain and suffering are, as we have often heard, a personal experience; and this fact must never be lost sight of in related studies, like epidemiology or the testing of hypotheses. Personal it is; yet the relief of pain, the solace of the person, is more and more seen as communal. The proper context for the control of chronic pain, and especially in terminal care, is a supporting community. The doctor is at the centre of it, of course, because he has the clinical responsibility for directing all the known resources from neurology, pharmacology and the like to the relief of the patient. But the nurses are in the community also, and they stand nearer to the patient than the doctor in many ways. So also are all who help in the wards, those who bring food or sweep floors. In St. Christopher's Hospice, London, which Dame Cicely Saunders founded, everyone working in the ward has to find time to sit on the bed, and talk, and listen, to the patients among them. The family and friends are in the community, and the priest, if his ministry is desired. Dying, like birth, becomes a social activity. The individual remains a person, relating to other persons, to the end.

It may be that the traditional, corporate societies of the East have retained this community sense. If so, they can encourage us in the West to recover it. And it has become clear in this Colloquium where the impulse to this community relief for pain is coming from. There are indeed impulses in our respective religions, notably Buddhism, Judaism and Christianity (and we heard some of them yesterday). "If one member of the body suffers, all the members suffer with it", St Paul wrote. But while the strength of religion may be weakened for a while as a social force, the impulse in the new approaches in medicine grows ever stronger. East and West now share one science, each contributing its own part to the whole, each taking and developing what it can from the other. Medical scientists now speak a common language, and we in the Colloquium have heard it spoken.

We would surely express our thanks and admiration for those who conceived the idea of bringing us together, and who have made this conversation so profitable; and, above all, so enjoyable and so enriching an experience.

CLOSING STATEMENT

BY

Mr F. VAN HOECK

CLOSING STATEMENT

Mr F. VAN HOECK

As Mr Yamamuro so rightly mentioned, we currently live in a world populated by 5 billion people, which is increasing exponentially and which could double in size within the next few decades.

These people must be fed, educated, given proper health care, and the means to survive in an increasingly competitive and industrial world. At the same time we must try to control the negative effects of industrialisation by preserving our natural resources, the environment, and by cleaning up the untold damage from pollution which currently besets the industrially developed world. This requires massive shifts in our behaviour, and thought, in order for us to re-direct our energies into the realisation of these objectives. Science can provide many answers to these problems and particularly the innovations and advances currently being made in the science of modern biotechnology.

In this respect I would like to remind you of the series of conferences on ethics which have been organized in the framework of the G-7 countries. The first of these was held at Hakone, in Japan and the last one took place here, in Brussels, in March of this year. It was organized by the Commission of the European Communities and its theme was "Ethics and the Environment". A pledge was made not only by the countries of the G-7, including Japan, but also the other Member States of the European Community, to have in the future a much more global approach towards the problems of the environment, to pay due respect to the other components of the environment such as living beings, animals, plants, micro-organisms, and also the atmosphere, and the seas. Everybody now is becoming more and more aware of this need for a more global approach to environmental protection.

The idea for this conference on the topic of "Pain and Society" was born during a fairly small meeting which took place more than one year ago now in Bonn. It was attended by Professor Okamoto, Professor Fasella, Professor B. Hess and myself, and I must say here that the fact it has taken place at all is due to the driving enthusiasm and organisational skills of both Professor Okamoto and Professor B. Hess.

The conference has demonstrated the fascinating outcomes of bringing together people representing different disciplines, ways of thinking, and cultures. In the past two days we have had ample proof of this and it is fair to say that two days was indeed too short for such an interesting and far reaching topic as "Pain and Society". However, we have noticed the large differences between the different ways of thinking in our Western society and in that of the Japanese, but we have also perceived points of conversion. As Professor Dunstan has said, "medical ethics is a universal concept". I think however the concluding message is that both cultures are converging more and more in accepting that scientific evidence, and the scientific grounds for knowledge and understanding of the phenomena involved in the manifestation of pain are of the utmost importance.

Finally, on behalf of the Commission, I would like to thank Professor de Scoville and the Royal Academies of Belgium for making these remarkable facilities available for our meeting. I would like also to thank the Honda Foundation and the Belgian National Fund for Scientific Research for funding and organising the meeting, and last but not least, to the participants, rapporteurs, chairmen, speakers, interpreters, and all those who have contributed to making this such a successful, and fascinating meeting. Thank you very much.

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