THE EFFECTS OF AEROBIC RECREATION ON THE WELL-BEING OF MEMBERS OF THE ADVENTIST CHURCH

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ABSTRACT

THE EFFECTS OF AEROBIC RECREATION ON THE WELL-BEING OF MEMBERS OF THE ADVENTIST CHURCH

by

Michael L. Chamberlain

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ABSTRACT OF GRADUATE STUDENT RESEARCH

Project Report

Andrews University

School of Graduate Studies
Avondale Campus

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Problem

That physical and mental health are indispensibly related is evidenced by the scriptures, the writings of Ellen White, and modern scientific research. Most Australians, including many Seventh-day Adventists, continue to neglect this relationship and its effects on well-being. One of the major keys, aerobic physical fitness, significantly improves positive mental outlook and effectiveness.

Method

This project set out to instruct, motivate and encourage persons to participate in an aerobics programme and to determine

possible improvements to physical and psychological well-being. A seminar programme consisting of six evening sessions illustrated by audio-visual material outlined the need for improved physical fitness and its significance on the mental, social and spiritual dimensions of man. Twenty volunteers accepted the challenge of commencing (or increasing) their aerobic recreation.

Two lifestyle questionnaires were answered, one at the commencement and the other at the conclusion of four months of aerobic recreation, when the results were processed and interpreted. This was intended to measure possible improvements in general well-being in such areas as patterns of sleep, dietary habits, headaches, optimum weight, church and community relationships, quality and quantity of exercise.

Results

While the results demonstrated that the majority of more objective factor variables showed small marginal improvement, perceived variables including enjoyment, relaxation, and general health showed definite improvement. Almost all participants realised their need of fitness through aerobic recreational type programmes.

Conclusion

A future model for an improved programme included an expanded community or relational model to complement the propositional or instruction model.

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A Project Report

Presented in Partial Fulfillment

of the Requirements for the Degree

Master of Arts in Religion

PROJECT
GMA
1982
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by

Michael L. Chamberlain

November 1982

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November 19, 1982
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To the unfit Adventist

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PREFACE

The Biblical concept of "body" as described in the New Testament indicates the paramount significance of:

1. The Christian community's relationship to each other
2. The individual's relationship to his being on the mental and physical plane

Adam was created in the form of a perfect physical body. Jesus Christ, as the second Adam endorsed the importance of the physical being through his incarnation and resurrection.

It is the writer's proposal to seek some confirmation that persons engaged in aerobically recreative programmes will show improvement from one to ten separate self-analysed functions related to either physiological or psychological well-being. It is therefore the writer's contention that these improved functions bear relationship to a more positive outlook concerning themselves as individuals, and their community--the church.

I wish to acknowledge the following persons for their help in editing, typing, computer analysis, and advice in this project. Pastor David Currie, Mrs. Gaya Currie, Dr. Gary Eggers, Mrs. Cheryl Garrett, Mr. Steven Garrett, Dr. Eoin Giller, Mrs. Joy Hallam, Dr. Jim and Dr. Thea Hanson, Mrs. Gaylene Heise, Mr. Owen Hughes, Dr. Ross Jose, Dr. Hilda Rainda, Dr. Alwyn Salom, Dr. Ray Swannell, Mr. Keith Wallace, Mr. Martin Ward.

INTRODUCTION

The approach to this project lies somewhere between, in the words of Norman Bradburn, a fox and a hedgehog.

> Hedgehogs approach problems in an integrative manner, trying to bring everything into a single, universal, organising principle that gives unity to the manifest diversities of life. Foxes, on the other hand, approach problems in a differentiating manner, and pursue many disparate problems with little concern for how they fit together or might fit into a larger integrated whole. Hedgehogs look for unity in diversity; foxes look for the diversity that underlies the unity.[1]

Hedgehogs may be termed theorists, while foxes empiricists.

This paper is not concerned with persons with psychiatric disorders or other social maladjustments. It is concerned with normal healthy people who seek to improve their coping abilities, and to have more effective relationships within their community and the world at large. It examines a specific group in the community--Christians from the Seventh-day Adventist Church who have become more aware of their responsibility to maintain their body's efficiency as well as the need to relate more effectively with others.

In seeking to understand the subject one is conscious of writing nothing learned or original. Indeed, in the words of Nathaniel Micklem, much of this material is either plagiarised or popularised, "ever twisting and untwisting the same rope."[2]

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[1] Norman Bradburn, The Structure of Psychological Well-Being (Chicago: Aldine Publishing Company, 1969), p.v.

[2] Nathaniel Micklem, The Theology of Politics (London: Oxford, 1941), p. ix.

The Relationship Between Proclamation and the Christian Community

The observations of Gottfried Oosterwal have stimulated the present writer to examine how the well-being of members in the Christian community can be improved, especially in the so-called leisure hours. Oosterwal comments: "... factors that cause or influence Seventh-day Adventist believers to leave the S.D.A. church seem to be intimately related to the ways people have become acquainted with the church ..."[1] He adds, that while some thirty-five people in every one hundred brought in leave the church, between "40-60% indicated that fellowship was a strong reason for joining the church."[2] The Seventh-day Adventist church through its present crisis of doctrinal understanding, is realising its need to be stronger in building a people who can relate better and cope more effectively during times of distress.

In the past, the church has been powerful in its proclamation and this must continue if it is to survive and retain its identity. However, a church based exclusively on truth in a propositional form may tend to disintegrate should its members not accept each other as part of the body of Christ. This occurs in part, from a failure to propogate effectively the fundamental law of life for Christians: "bear one another's burdens, and so fulfil the law of Christ."[3]

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[1]Gottfried Oosterwal, Patterns of S.D.A. Church Growth in North America (Berrien Springs, Michigan: Andrews University Press, 1976), p. 4.

[2]Ibid., p. 26.

[3]Galatians 6:2 (RSV). All other quotations are from the KJV unless otherwise stated.

In being influenced to join the church, 55-70% of men surveyed said that neighbours and friends were the most significant factor. In the same survey on women, 38% of women rated friendships as a significant factor in deciding for the church. The men recorded a lower figure of 10-14% on the influence that the S.D.A. minister had upon them as a friend.[1]

A high 54% of women said that the church's emphasis on health attracted them.[2] While it would be foolish to deny that the church's systematic set of Biblically-based doctrines are vital to the identity of the "remnant church," it would be equally foolish to rest alone on that which people in the church have come to call, "the truth." People have not only entered "the message" but have entered the body of Jesus Christ! This is best demonstrated to the world by our acceptance of each other and a desire to share the burdens and problems that are faced along with the joys of success. Unfortunately, even in 1982 we tend to remain a body in isolation."[3]

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[1] Oosterwal, p. 36. It was also disturbing to note that a low percentage of youth from SDA homes ranked the minister as a significant influence to win them to Jesus Christ or help them in their spiritual growth.

[2] See Appendix 1.

[3] "Adventists a Secret," Adventist News, No. 27, (17 June 1982-3), p. 6. "A recent report by a top-ranking Australian journalist, Dr. Kim Mukerjee, says 'You Adventists must be the best kept secret in Australia.' Dr. Mukerjee was commenting on the wide range of services offered by the Seventh-day Adventist church. Dr. Mukerjee claims that 40% of Australians say they are religious but without a biblical connotation. Half the people whom he says understand the word 'religious' in a bibilical sense do not attend church. The Brand Management Group operated by Dr. Mukerjee ran the survey which found that 60% of those interviewed knew little or nothing about Seventh-day Adventists."

As a solution to this problem, Oosterwal comments concerning the men in the church: "The church may have to develop more activities for men according to their interests and capabilities."[1] He also suggests that the Church leaders may need to take a critical look at their own attitudes and associations with men in their congregations, and lead them into more meaningful team work and fellowship.

With increasing urbanization and secularization in the world, especially in the western nations, many more people are lonely, non-churched, and turned-off from Christianity, than earlier in this century. It is very possible that an increasing number of new members are feeling alienated by "culture shock." They are not being included in the new lifestyle of the church, or feel little attraction toward those who are pessimistic, negative, and indifferent to their newly acquired relationships with Christ and the church. Because relationships must be a powerful factor for the survival of the Seventh-day Adventist church,[2] non-believers should be given every opportunity to see that the church is a welcoming, accepting, and understanding body of believers. Proclamation without fellowship is sterile propaganda.

The Relationship Between Individual Well-Being and the Christian Community

This project seeks to investigate the function of sōma, the physical body, as the temple of God's Holy Spirit, in relationship to the figurative body of Jesus Christ, the church. The area

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[1] Oosterwal, p. 38. [2] See Appendix 2.

of investigation is within the framework of physical exercise as a means of improving the well-being and fellowship of the body of Christ. Some evidence would seem to suggest that when aerobic exercise programmes are engaged in, many people appear to enjoy life on a higher plane, to cope more easily when confronted with stressful situations, and to adopt a more positive and resourceful attitude to life in a practical manner. Because they enjoy life more, their contribution to the church is more efficient and more likely to bring healthier attitudes in both mind and body for the benefit and blessings of fellowship.

Although identifiable diseases in the Western world have been drastically reduced since the beginning of the twentieth century, the ease of living with its affluence and softness has brought a host of bad habits to contemporary man. Many of these habits are now being diagnosed by medical science as the new giant killers of society.[1] As a result, most people are choosing their way to die, simply as a result of their bad habits.

The dualism of Plato that espoused the fragmentation and alienation of relationships between the body and the mind, appears to have influenced the continuing concept of neglect, preventatively speaking, of the health of our physical maintenance and efficiency.

The New Testament indicates that when either the body, mind, or spirit of man are at risk, then the whole of man's being is threatened. Spiritually, our relationships to each other are affected. Physically, pain impedes our effectiveness.

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[1] See Appendix 3. Death Rates of Selected Diseases: U.S. 1900-1970.

Psychologically, depression or anxiety prevents positive and realistic decisions being implemented. The quest for every responsible human being should be to develop and maintain to their best ability, the needs of the total environment. This could be seen to be implied in Paul's dictum "I have become all things to all men."[1] Again in his letter to Corinth, Paul speaks to Christians as being "letters of recommendation,"[2] which may be interpreted to highlight the importance of man as a total being in his efforts to reflect the character of God.

Jesus' approach was integrated and wholistic--a far cry from the Platonic dualism that depreciated the body to merely a prison for the soul. Descartes (1596-1650) attempted to revive the dualism of personality into mental and physical categories. He considered that only the mental sphere was a matter for the churches' operation.[3]

Nevertheless, Jesus was clear about the integral nature of the mental, physical and spiritual aspects of man's being. His concern for the body, never neglected the mind and spirit of the sufferer. Harrison asserts, "... the therapeutic activity of Jesus included significant spiritual as well as psychological considerations, directed at the restoration of the entire personality."[4]

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[1] 1 Corinthians 9:22 (RSV).

[2] 2 Corinthians 3:1-3 (RSV).

[3] R. K. Harrison, "Healing," Interpreter's Dictionary of the Bible (Nashville: Abingdon Press, 1962), 2:546.

[4] Ibid., p. 547.

This project is written in relationship to the Christian community. Despite our acquired knowledge of health, there appears to be a skewed emphasis toward diet rather than a balance between eating and activity. Our ignorance of this balance, rather than being inevitable, could be labelled as culpable. No informed Christian can show disregard for the body's well-being whether on a mental or physical plane. It is the right and privilege of every Christian to stay in shape physically as well as mentally and spiritually. Should the proposition be accepted that man is a psychosomatic creature (and indeed there is evidence to suggest this), it would appear that many Christians are caught in the philosophy implied by dualism, i.e. their body is merely an appendage or item of baggage in which to house the mind. The human body is not conceived of in scripture as a temporary burden. It is the temple of the Holy Spirit. In this domain we can be as guilty as the so-called pagan who neglects both spirit and body. Says O. Quentin Hyder:

> There are lots of books on spiritual fitness in religious book stores and there are lots of books on physical fitness in secular book stores but I've never seen a book written specifically for Christians exhorting them to take care of their God-given physical bodies.[1]

Some Christians have cried "All you need is Jesus," but forget that Jesus needs <u>all</u> of you. It is reasonable to conclude that when body and mind are in good shape we are more effective servants of Christ. There is a real anomaly in the spectacle of

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[1] O. Quentin Hyder, <u>Shape Up: A Christian's Guide to Total Fitness</u> (Old Tappan, New Jersey: Fleming H. Revell Co., 1979, p. 14.

a so-called Christian who makes a call for sound doctrine yet is miserable and even neurotic.

Hyder further remarks: "Many of the patients I see daily in my psychiatric practice would never have needed to have come if they had been in excellent physical condition."[1]

It is the writer's proposal that many who are finding that coping and relating are burdensome, would alleviate their distress and hurt by allowing positive changes to occur in their lifestyle. One of these changes may well be in the area of recreational exercise in order to improve their physical and psychological well-being. As Edward Stanley once said: "Those who think that they have no time for bodily exercise will sooner or later find time for illness."[2]

Those who are engaged in such activities as aerobic[3] recreation along the suggestions proposed in this project, may find it easier to meet challenges, explore possibilities and attempt more difficult exploits for Christ and the Church in a positive manner. This will be due in part to a higher experience within the context of Calvary, through improved physiological and psychological well-being.

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[1] Ibid., p. 27.

[2] Emmanuel Cheraskin and W. M. Ringsdorf, Predictive Medicine (Mountain View, California: Pacific Press, 1974), p. 101.

[3] i.e. requires free oxygen or air in order to live or to thrive.

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CHAPTER I

THE INDIVIDUAL AND CORPORATE NATURE OF THE TERM 'BODY'

Body in Non-Biblical Literature

Berkouwer, when reviewing the position of contemporary Christian theology to man's body and spirit, remarked:

> In our consideration of man as the image of God, there is every reason for us to devote attention to the fact that in our discussion of man we are dealing with the whole man, and that we can never gain a clear understanding of the mystery of man if in one way or another we abstract mere components of the whole man ... the doctrine of the image of God has often suffered from such abstraction especially in relation to the human body.[1]

According to Schweizer, from the earliest ancient Greek literature, the basic meaning of sōma has almost always implied the whole of man's body.[2] However, between the era's of Plato and Aristotle, the body "is in essence defined negatively." It was considered that to keep the body in shape, it required "the skill of the doctor and the gymnastic instructor to remain healthy and beautiful."[3] A man who desired the physical aspects of life was

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[1] G. C. Berkouwer, Man: The Image of God (Grand Rapids, Michigan: Wm. B. Eerdmans, 1962), p. 194.

[2] Eduard Schweizer, "sōma", Theological Dictionary of the New Testament (Grand Rapids, Michigan: Wm. B. Eerdmans, 1964), 7:1025 (Hereafter cited as TDNT).

[3] Ibid., p. 1028.

considered retrograde. Schweizer says that Menander considered the good body which has a bad soul as "compared to a ship with a poor helmsman."[1]

Plato's conception of body did as much to denegrate the physical nature of man as any Hellenist thinker or indeed any philosopher in the history of the world. For Plato, "the body was the grave of the soul."[2] The body belonged to that which was below, the soul to that which was above. The body was the stake or cross upon which the soul is impaled.[3] Seneca and Epictetus also recorded some harsh things about the physical body of man. "[It] is only a contemptible burden, penalty, fetter and dark abode of the soul."[4] "[The body] is alien to us ..., a beast of burden ..., the product of filth."[5]

Man was to be understood as psucharion "bearing its corpse with it." The body was to be washed and looked after although it was said that Socrates seldom bothered, demonstrating the belief that it was only a secondary thing.

Plotinus, another Greek thinker, thanked God that he was not created with an imperishable body.[6] Plutarch extols freedom of the soul in contrast to the evil lusts of the body. "For this

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[1] Ibid., p. 1030.

[2] John F. Gates, Adventures in the History of Philosophy (Grand Rapids, Michigan: Zondervan, 1961), pp. 20-21.

[3] Ibid. [4] TDNT., 7:1036.

[5] Ibid.

[6] S. D. F. Salmond, The Christian Doctrine of Immortality (Edinburgh: T. & T. Clark, 1895), p. 547.

reason one should love the soul rather than the body ... the body is the mill of the soul in which the slaves do penal work."[1]

For Babbage,

> There could hardly be a greater contrast between this Hellenic conception of the body as a tomb of the soul and the Hebraic (and Christian) conception of the body as a "temple." The Christian hope does not speak of liberation but of transformation ... the body in the Christian understanding is not evil but holy. The spirit is 'clothed' with body.[2]

Anthropological dualism is not portrayed in scripture. The Bible does not delineate a higher and lower part in man, implying that one is better, or holier than the other. There is no part of man that is considered more impure, or sinful, or further away from God. Berkouwer considers that although dualism may not deny the creation of the whole man, "nevertheless it becomes difficult to honor man's body as part of his full and genuine creatureliness and humaness."[3] The deprecation of man's body exalted ascetism, as a theory of salvation. Sin is not localised in any one part of man, although theologians and others have made various attempts through history. The real seat of sin was in the heart of man which was the centre of his being.[4] This has no organic connotation or peripheral meaning. In Neo-platonism and Stoicism, the soul continued to be expressed as the higher part of man. The body was of little value. When added to the soul it defiled

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[1] TDNT., 7:1040.

[2] Stuart Barton Babbage, Man in Nature and in Grace (Grand Rapids, Michigan: Wm. B. Eerdmans, 1957), p. 574.

[3] Berkouwer, p. 203.

[4] Mark 7:21-23.

its purity. It is considered a "fetter ... a mere sack."[1] Josephus considered the human body to be both strong and weak. When exposed to maltreatment it showed its fragile nature. He claimed that the Spartans engaged in exercises for the caring of the efficiency of the body. When Josephus referred to body and soul they can be the best of friends. Suicide, the severing of the soul from the body, was considered a grievous act. However, Schweizer observes that there was "a strong tendency to see in the body no more than the abode of the soul which alone is the true ego."[2]

Philo stressed the totality of the human body. He also substituted sōma for kōinonia, using it as a figure of speech either for the cosmos or for society. The Sabbath was a necessary observance for the benefit of body and soul, as was fasting. Man was to be healthy in both domains. "One should love sōma, and psuchē, the body is the house, the holy temple."[3]

Gnosticism followed in the tradition of earlier Platonic philosophy by maintaining that the soul was worthy but the body was despised. One of the defiling mechanisms was the act of sexual intercourse. The perfect man, while fashioned from above, was also separated from sōma. The body of real man was but a grave.

> It is made of quarrelsome stoicheia, and is thus a place of constant battle. From hylic and devilish matter, the demiurge creates bodies for souls.[4]

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[1] TDNT., 7:1043. [2] Ibid., p. 1057.

[3] Ibid., p. 1051. [4] Ibid., p. 1087.

Manicheanism also viewed the body with disdain. "It was made by sin" and is "a prison and tomb of the soul." In fact the body was said to be the seat of sin."[1] In contrast to the central theme of Christianity, the resurrection of the body, Manicheanism emphasized transmigration of the soul.[2]

The general thought pattern of dualism where the body was considered sinful, low, earthy, unspiritual and secondary, has remained with Western society to this day. Despite the advent of mushrooming scientific discovery and sophisticated lifestyles, our community today is still dogged by the philosophies of Hellenism of some 2300 years ago. Nowhere was this experienced more strongly than in the Victorian era where the sight of flesh was often considered distasteful and rude. Since then, especially in the last two decades, dualism has given ground to a wholistic approach to man. Dynamic relationships have been seen to be more important than static individualism. Many people are taking a new look at what man is made of and the value of his physical self in relationship to the rest of humanity. Unfortunately, because we are creatures of imbalance, it is possible that after the drought of such recognitions, man might wish to go too far, and eventually attempt to deny the spiritual relationships. Already these seeds have been sown, and their fruit is beginning to be born.

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[1] Ibid., p. 1089.

[2] Ibid.

Body in Biblical Literature

a. Old Testament

Of the unity of man, Berkouwer suggests that:

> ... the Biblical view of man shows him to us as an impressive diversity, but that it never loses sight of the unity of the whole man but rather brings it out and accentuates it ... religion deals with the relations of the whole man with God.[1]

The psalmist respected the magnificent unity and interrelationships of his being when he said, "I am fearfully and wonderfully made."[2]

The physical nature of man whether of earthly or heavenly origin was always designed to stamp him as a unique creation of God. Adam was created from the earth as a perfect specimen of physical health and stamina.[3] His flesh before sin was used entirely for the glory of His father. Because of this state of body, his mind was able to have total visual and audible communication with his Father.[4]

When sin entered into the heart of Adam and Eve[5] their attitude towards their physical bodies changed. Now they were "ashamed" and experienced a nakedness physically as well as one of spiritual, social, and mental alienation. When their eyes were

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[1] Berkouwer, p. 200.

[2] Psalms 139:14. While there is some uncertainty concerning the exact translation of this text, the Hebrew tends to support the idea that the psalmist is extolling the wonders of the human frame. (See Francis D. Nichol, ed., The Seventh-day Adventist Bible Commentary 7 vols., (Washington, D.C.: Review and Herald, 1954) 3:926.

[3] Genesis 2:7; 1:27.

[4] Genesis 2:15; 3:8.

[5] Genesis 3:6, 7, 15.

opened, guilt closed their previously unhindered fellowship with God and their identity and image was broken. For this couple, flesh had become a liability; sweat, physical toil, and its associated pain, a reality.[1]

In the opinion of J. Laidlaw "throughout the whole of scripture the place of body as an integral constituent of man's nature is insisted on."[2] In the Old Testament, however, there is no single term to denote the human body. The most common Hebrew term being basar "flesh" found 269 times which in the LXX is translated flesh, but can also be translated sōma, body.[3] Motyer agrees that although man is both psychical and physical in Old Testament theology,[4] Psalm 61:3 shows man longing for God in both spheres. There is no evidence to suggest, however, that either are subservient or separable. The very act of sexual union is described "they shall be one flesh."[5] Holy life in the Old Testament is constantly related in fleshly terms. Genesis 17:3 says that covenant is "in your flesh." There can be no salvation of man unless it is salvation of the flesh. The body of man was not described as an accidental appendage. It is a necessary and indispensable expression of the existence of man in God's image.

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[1]Genesis 3:19.

[2]J. Laidlaw, "Body," Dictionary of the Bible (Edinburgh: T. & T. Clark, 1898), 1:309.

[3]Owen R. Brandon, "Body," Baker's Dictionary of Theology (Grand Rapids, Michigan: Baker Book House, 1960), pp. 101-2.

[4]John Alexander Motyer, "Flesh, Fleshy," Baker's Dictionary of Theology, pp. 222-24.

[5]Genesis 2:24.

While there is the thought on occasions that the flesh is weak, "In God I have put my trust; I will not fear what flesh can do to me."[1] Morris says that this is not to mean moral weakness but "the physical frailty of man."[2]

The Hebrew interest in human nature according to H. Wheeler Robinson is:

> Concrete synthetic and religious; the Greek is abstract, analytic and philosophical ... In the Old Testament there is no sign of metaphysical psychological or ethical dualism ... In the New Testament the contrast of the inner and outer life has no metaphysical significance, nor does the antithesis of mind and body supply the ultimate key to the moral problems.[3]

b. New Testament

1. The body as an individual

> Do you not know that your body is the temple of the Holy Spirit within you which you have from God? You are not your own, you were bought with a price so glorify God in your body.[4]

The New Testament frequently refers to the physical nature of man as an integral function of the social, mental, and spiritual aspects of his being. Paul states that our body is "God's temple." It was "bought with a price" and is therefore of inestimable value. Defiling or perverting the body's use was anathema. For a person or persons to seek deliberately to destroy this instrument which

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[1] Psalm 56:4.

[2] L. L. Morris, "Flesh," The New Bible Dictionary (London: Intervarsity Fellowship, 1962), pp. 425-26.

[3] H. Wheeler Robinson, The Christian Doctrine of Man (Edinburgh: T. & T. Clark, 1911), pp. 152-54.

[4] I Corinthians 6:19, 20 (RSV).

houses the very Spirit of God, was asking for the very same treatment from God, that of eventually destroying that person.[1]

Man's physical being is featured in the gospel of Jesus Christ as an indispensible relationship with God. Through the mercy of God our bodies are to be presented as living sacrifices, "holy and acceptable" and an instrument of worship toward God.[2] Christian growth, writes Richard Halverson, "... is not the struggle to become the kind of person we think God wants us to be, but a surrender of our bodies, all our faculties, our right to ourselves, to God ..."[3] Our minds are to be renewed in Him in order to prove His will, to know goodness, to be accepted and to understand His perfection.[4] The context of his body-sacrifice is not only in relationship to his creator, but to his fellow creation as male and female in the body of Jesus Christ.[5]

The word 'body' in the New Testament has been translated from the Greek word sōma. It has two basic dimensions: (1) referring to the individual as a temple of the Holy Spirit;[6] (2) referring to the church and the community of Christ as the body.[7] The first use is literal, the second is figurative. P. S. Minear said to sōma tou christou offers a many faceted relationship between Jesus Christ and his members and their relations to one another in him.

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[1] 1 Corinthians 3:17. [2] Romans 12:1.

[3] Richard C. Halverson, Be Yourself . . . and God's (Grand Rapids, Michigan: Zondervan, 1971), p. 53.

[4] Romans 12:2. [5] 1 Corinthians 12:13,14; Galatians 3:28.

[6] 1 Corinthians 3:16. [7] Romans 12:5.

> It expresses the bonds of mutality and solidarity accomplished in His death ... the intimate and strong bonds created in His resurrection. The corporate life of those who are in Him is embodied in both His dying and His rising. Oneness with Him is made real by the one baptism ... [and] is inseparable from the work of one spirit which supplies power, hope, peace, and love throughout the whole body. The members of his body consider their bodies as united to Him ... and carry about in those bodies the death of Jesus ... Within one body the gifts of the Spirit are apportioned ... Through this body Christ struggles with the rulers of the age, overcomes them and shares with His people the fruits of victory.[1]

It is in the letters of Paul that Christ's body link to the Church is most explicit and developed. The images of the new adamic man, the temple-body, the household of God, and the commonwealth of Israel, are here viewed in their clearest light.

As already indicated, the importance of the body of man is figured in the redemption from slavery and the restoration to sonship. While the new man lives under the power of the Holy Spirit, experiencing a glorious liberty, it is still in the flesh. "We wait," as Paul says, "for our adoption, to wit, the redemption of our body."[2] Babbage reminded us that we do not long to be free from the body but to be renewed in it.[3] Man's body is not a "clog and an encumbrance, to be shed and discarded," in the future life.[4] It is "a necessary part of man's being a vehicle and an instrument for the expression of man's personality."[5]

That Jesus offered up His body in the New Testament is an unprecedented sacrifice even in pagan belief systems. The Greeks

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[1] P. S. Minear, "Christ, body of," The Interpreters' Dictionary of the Bible (Nashville, Tennessee: Abingdon, 1962), 1:571.

[2] Romans 8:23. [3] Babbage, p. 27. [4] Ibid., p. 28.

[5] Ibid.

seeing the body as alien, unimportant and transient, cared little for its offering as a sacrifice. Yet it was in Jesus' stupendous act of offering up his body that salvation for men was achieved. In Hellenism there is scant reference to the body as a sacrifice.

It was in the Lord's supper that the shaping of the vocabulary of sacrifice was apparent. Jesus said, "This is my body, broken for you."[1]

When examining Jesus' attitude to the flesh in the New Testament, it was very apparent that there was no contempt toward those handicapped or sick. From the outset of His first sermon, Jesus demonstrated His particular interest in the frail and feeble both in body and mind. For Him, human wholeness was paramount. The total man was the object of salvation.[2] Many of his miracles included the restoration of the body to wholeness.[3]

For Paul there were no illusions about the future life. It was a bodily one. The dead rise in a body. Heavenly being is life in a body, a new building or house[4] which comes from God. Both the word for building or house are parallel terms for the body.[5] Heavenly being has nothing to do with incorporeality.[6] He declares in Philippians 3:21 that our bodies will put off lowliness and will accept a body of glory like Jesus. Here sōma is more than an

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[1]Mark 14:22. [2]John 3:16; 10:10.

[3]Matthew 4:23,24; Luke 22:50,51.

[4]2 Corinthians 5:1-10.

[5]TDNT, 7:1060. [6]Ibid., p. 1061.

external form. It is a bearer of both earthly and heavenly being. This body will be "united with Christ" even to the point of corporeality.[1]

Because non-bodily life is inconceivable for Paul,[2] the resurrection can come only through judgment,[3] by what we have done in the flesh. Our bodies are not a burdensome envelope, but the very stance by which men shall be tested. It is in terms of deeds done in the body that we shall be questioned in the judgment. The judgment in the body determines the responsibility that man faces in relationship to his physical activity, notwithstanding that faith is the key factor to salvation.[4]

Of even more startling significance is the Bible's concept of our mortal bodies being raised.[5] According to Schweizer, "the apolutrōsin tou sōmatos in Romans 8:23 is not redemption from the body or from a bodily existence generally, but the redemption of the body."[6] Man is not burdened by sin and death because of corporeality. Sin is man's sin and death is man's death. It was his choice originally through the sin of Adam.

Schweizer observes:

> Precisely for this reason [i.e. man's corporeality] Paul also realises that God will raise up and transform this body and

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[1] While Paul in 2 Corinthians 12:1-3 suggests the possibility that man may achieve a heavenly ascent outside the body, to him it is of little consequence whether in the body or out of the body. Secondly, Paul would not have considered it worthy of discussion unless his opponents had forced him to do so. Thirdly, it was in vision that the ascent was made and not in normal life. (See context of verse 1.)

[2] 1 Corinthians 15:35-44. [3] 2 Corinthians 5:10.

[4] Romans 14:23. [5] Romans 8:11. [6] TDNT, 7:1062.

> that consequently this body must already be seen here and now as a body that is being raised up. This is what makes all life in the body so responsible.[1]

Paul is adamant by his use of such examples as the buffeting of his body,[2] that service and body life are inseparable. Paul therefore brought his body into subjection in order to set it in service for Christ. Likewise the sacrifice of the body is seen as an ultimate method of service.[3] When the Spirit of God is within man, the significant point is not the liberation of the soul from the body, but the initiation of the body into service and dedication to God through Jesus Christ. While in some New Testament passages Paul uses sōma to refer to body as an instrument of sacrifice,[4] in other passages nearby he finds new imagery in the term when it is used of the Christian community.

2. The body as a community

> "Now you are the body of Christ and individually members of it."[5] "That there may be no discord in the body, but that the members may have the same care for one another."[6]

Paul does not merely say that the community is like a body, he says that it is a body, and that community is in Jesus Christ. This concept was an advance on Stoic parallels and in opposition to Platonic thought. The body of Christ is the community of Jesus Christ, and is never expressed in terms of one individual.[7]

For Paul sōma is primarily the corporeality in which man lives in this world. It is a body given in the first instance

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[1] Ibid. [2] 1 Corinthians 9:27. [3] 1 Corinthians 13:13.

[2] Colossians 1:22; Ephesians 2:13 ff. [5] 1 Corinthians 12:27.

[6] 1 Corinthians 12:25. [7] TDNT, 7:1070.

for others.[1] In this there is a two-fold sense. The first is expressed in 1 Corinthians 12:14-27, and Romans 12:3-8 which deals mainly with the relationship of members to each other. The second sense encompasses the whole community within and without the church as His body, Christ being the One who offers Himself up for the world, and to serve it. Schweizer suggests that "although this cannot be demonstrated materially from these letters in the direct use of sōma Christou the thought is behind the phrase."[2]

The choice of the special term sōma is largely the result of its parallels to "building." Here "bodily" is not the same as physical. It is used to emphasise unity in the body. It denotes life in common with others and one's dealings with them.[3] It refers to one's opportunity to meet and to know others. Within this body there are separate functions and every member is basically important in their ministry.

And so in concluding this second section on the dynamic and comprehensive New Testament term sōma, J. A. T. Robinson incisively remarks:

> It is from the body of sin and death that we are delivered; it is through the body of Christ on the Cross that we are saved; it is into His body the Church that we are incorporated; it is by His body in the Eucharist that this Community is sustained; it is in our new body that its new life has to be manifested; it is to a resurrection of this body to the likeness of His glorious body that we are destined.[4]

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[1] Ibid., p. 1069. [2] Ibid., p. 1074.

[3] Ibid., p. 1073 cited in footnote 462.

[4] John A. T. Robinson, The Body (London: S.C.M. Press, 1961), p. 9.

Conclusion

There is a contrast between Hellenism and Christianity in their approaches to the creation of God--the human being. It becomes clearer to Christians that contemporary mankind has been saddled with some negative, disheartening and dangerous philosophies concerning man as flesh. These have lingered long, and remain attractive to a large section of uninformed public, who have not yet appreciated the dynamic goodness or the moral responsibility, inherent in man's physical life, through an understanding of the gospel of Jesus Christ. Although man has a broken relationship with God, his physical being is not intrinsically sinful despite its drastically weakened state. The use of Old and New Testament images gives sufficient indication that we need to take care of our physical selves to effectively allow the mind of Christ to dwell within.

The Christian is responsible for his own flesh, or body, as well as being responsible to the community in which he worships and serves. He should not seek to grow on his own as an egotistical empire builder. Christ has placed us in the body and desires us to grow for the benefit of other brothers and sisters.

When the body of Christ is functioning responsibly, then the individual's body will be aided toward a state of health acceptable to God. When man accepts his responsibility as a temple of the Holy Spirit then he shall be mindful of his body's needs and its spiritual relationship.

CHAPTER II

RECREATION AND MODERN THOUGHT

Eighteenth and Nineteenth Century Developments

During the Age of Enlightenment, Rousseau (1712-78) probably more than any other philosopher, argued the need for the development of physical fitness. In his book Emile he writes:

> Give his body continual exercise: make him robust and sound in order to make him wise and reasonable: let him work and move about and run and shout and be continually in motion.[1]

It was the eighteenth century that saw the transition of ideals concerning the needs of the body. Rousseau's theory was practiced by John F. Guts Muths (1759-1839).[2] He directed his students to various physical pursuits including gymnastics and labour for two to three hours a day. Because of Guts Muth's wide influence and respect, he is regarded as the founder of modern physical education.

Another European, Heinrich Pestalozzi (1746-1827)[3] of Switzerland, compared a child to an unfolding plant. He advocated the need for natural harmonious and systematic development of a child's mental, moral and physical powers.

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[1] Quoted in Emmett A. Rice, John L. Hutchison, and Mabel Lee, A Brief History of Physical Education, 4th ed. (New York: The Ronald Press, 1958), p. 81.

[2] Ibid., pp. 83-86. [3] Ibid., pp. 89-91.

Likewise, Phillipp Emenuel von Fellenberg (1771-1844), developed Pestalozzi's philosophy and introduced manual labour programs including games and physical exercise, to balance his project.[1]

And so it was, that the work of Rousseau, Guts Muths, Pestalozzi, and von Fellenberg, having influenced European thought, crossed the Atlantic and made impact on the pioneering spirit of early North America.

In this formative period of United States history, exercise was very much part of their lifestyle, although little of this was spent in leisure or recreation. In the Puritan communities, where religious influence was strong, there was a tendency to equate play with sin. Children, while encouraged to master writing, reading, and arithmetic at primary level and to appreciate the classics at finishing school, were given little time for recreative activity.[2]

By the 1830's and 1840's, manual labour-based education rated prominently in the curriculum.[3] Yet, while the idea of manual labour gradually began to lose favour, American conservatives developed formal exercise systems based on German and Swedish models. The Puritan idea that play equalled sin slowly dissipated.

German, Danish, Swedish, and English systems of education influenced the development of American education with their emphasis

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[1]Ibid.

[2]Charles A. Bucher, Foundations of Physical Education (Saint Louis, Missouri: C. V. Mosby Co., 1972), pp. 308-309.

[3]Ibid., p. 201.

on gymnastics, muscular strength and agility. Many devices were used to achieve this including the horizontal bar, parallel bars, ropes, and rings.[1]

And so the development of the importance of physical education in the eighteenth and nineteenth centuries could perhaps be summarised best in secular arenas by the philosophy: "A debilitated body enfeebles the soul ... If you would cultivate the intelligence of your pupil, cultivate the power which is to govern.[2]

Developments in the Twentieth Century

By the turn of the twentieth century, competitive team sports were increasing and "big sport" had begun to spawn a corresponding brutality, especially in football. Such sporting activities appeared to sink to an all-time low in 1905, when President Roosevelt issued an ultimatum that if brutal play in football were not eliminated, he would abolish it by legislation.[3]

Since then, with the advent of sports medicine and the decrease of manual labour activities, competition has become more intense and subtle. Perhaps the most recent significant milestone in physical health was set with the research and subsequent monumental books by Dr. Kenneth Cooper in Aerobics, The New Aerobics, and Aerobics for Women.

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[1]For a fuller explanation, see Rice, Hutchison, and Lee, pp. 217-21; 282-91.

[2]Quoted in Rice, Hutchison and Lee, p. 81.

[3]Frank G. Menke, The Encyclopaedia of Sports (New York: A. S. Barnes and Co., 1969), p. 370.

The resultant upsurge of cardiovascular fitness throughout the western world in particular, has been phenomenal. This so-called new fitness craze was summarised by Time, "One, two, ugh, groan, splash: get lean, get taut."[1]

The renewed interest in recreational and leisure activities was gaining momentum by the mid-seventies. An American survey[2] conducted in 1976 recorded 103.5 million persons participating in swimming on at least an occasional basis. Other activities included bicycling 75 million, table tennis 32.2 million, tennis 29.9 million, and jogging 8.5 million.[3]

In 1978 Harris's Perrier Survey of Fitness in America revealed that "41% of Americans get no exercise at all, 44% are somewhat active and only 15% are seriously involved in regular exercise." Of interest in this survey was the finding that "the family is 'one of the most important but overlooked influences on physical fitness: children tend to take up sports if their parents do.'" It was also discovered that 28% of highly active Americans say that exercise has, among other things, improved sexual relationships.[4]

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[1] "America Shapes Up," Time, 2 November 1981, p. 88. Further Time observes: "As recently as twenty years ago, for most people, the body was hardly more than an interesting mass somewhere down there below the head ... if the body belonged to Clint Eastwood or Sophia Loren, it was interesting. Otherwise, except in bed, it was ignored by the public in favour of more important pursuits ..."

[2] Ibid.

[3] "How Americans Pursue Happiness," US News and World Report, 23 May 1977, p. 63.

[4] "Running Battle," Time 5 February 1979, p. 58.

Finally, Harris comments that the psychological benefits of exercise are so obvious "... that many troubled, chair-bound Americans may wish to take it up as a form of therapy."[1]

A survey on one large marathon in America reported that: "Eighty-five percent of runners surveyed in the 1978 New York City Marathon, the largest in history, had college degrees, and half of those had post graduate degrees. There were 767 lawyers, 547 doctors, 977 teachers, and 98 Company Presidents."[2] Sharkey comments that: "Until recently less than five percent of the adult population of the U.S. was involved in regular aerobic exercise."[3]

But by the commencement of the 1980's the market "for all kinds of sports shoes alone has approached one billion dollars in the U.S.A."[4] Literally billions are being spent to aid the needs of the body.[5] Such has been the swing towards the enhancement of physical being that Time astutely remarks: "More than waistlines may be getting leaner. In fact the glorification of the body, the absorption with physical beauty, the passion for youthfulness and health that are now part of everyday American life at home and on the job are transforming the nation's character, like it or not."[6]

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[1] Ibid.

[2] Kevin Shyne, "Running Free," Toastmaster, March 1980, pp. 27-28.

[3] Brian Sharkey, Physiology of Fitness (Champaign, Illinois: Human Kinetics Publishers, 1979), p. 3.

[4] "America Shapes Up," p. 89. [5] Ibid. [6] Ibid.

One reason for this change of direction, appears to be the swing from negative to positive addiction.[1] Says Michael O'Shea, owner of the Sports Training Institute in New York City:

> Most of the people my age have been through the drug scene, Vietnam, protesting and all that. Now, instead of being a workaholic to the point where you have to have a house and a car, we want something to equate how we feel about exercise. If you spend more time on something like exercise, you may like yourself a little better.[2]

Physical Well-being and the Contemporary Australian

Despite the increasing interest and participation in aerobic exercise programmes in Australia, Geoffrey Vanderfield could remark as late as 1978, "Very few Australians participate in regular physical activity."[3] Perce Russo stated of Australians at that time,

> Australians have the third highest rate of heart disease in the world ... about fifty percent of all Australians are overweight ... [with] the average male over twenty-five being 12 kilograms over ... Australians are a nation of pill poppers, among the world's most enthusiastic, spending at least $340 million on pills and potions.[4]

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[1] William Glasser, Stanton Peele, Archie Brodsky, et. al., have seen this to mean that when a person's attachment to sensations, objects or people lessens his appreciation and ability to deal with the environment and the community, this may be termed as negative addiction. His coping-relating abilities to meet the demands of various challenges are diminished. William Glasser, Positive Addiction (New York: Harper and Row, 1976). Stanton Peele and Archie Brodsky, Love and Addiction (New Jersey: New American Library, 1976).

[2] "America Shapes Up," p. 89.

[3] Geoffrey Vanderfield, "Forward" in Perce Russo, Aussie Robics (Sydney: Paul Hamlyn Pty. Ltd., 1978).

[4] Ibid., p. 15.

Of leisure time, Russo observes that sedentary activites or inactivites are largely spent watching television or other spectator type programmes as in football, racing, and cricket. "Most people spend 80 to 90 percent of their leisure time in this way," causing the average Australian to be "soft and lazy."[1]

In contrast to Australia's preoccupation with the so-called "good life," The World Health Organization's definition of a healthy man might find the average Australian neither sick nor well. It states: "Health is a state of complete physical, mental and social well-being and not merely the absence of disease, or infirmity ..."[2] Nevertheless, there are individuals and organizations in Australia that promote and experience a superior state of well-being. One such group is the Seventh-day Adventist Church. In a study conducted in 1979, Webster and Rawson concluded that Adventist lifestyles were, "Conducive to lessened morbidity, delayed mortality, and a decreased call on health services in comparison to the rest of the population."[3]

Findings of this nature may cause some members of the Adventist Church to feel satisfied about their lifestyle. While an advantage may be seen from the heritage of health reform principles of Ellen White, it is the writer's opinion, that, aerobic exercise remains a misunderstood or neglected area of healthful living. This may be due to the influence of contemporary

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[1]Ibid., pp. 17-18. [2]Ibid., p. 20.

[3]Ian W. Webster and Graeme K. Rawson, "Health Status of Seventh-day Adventists," The Medical Journal of Australia 66:1 (19 May 1979):417.

Australian cultural norms, arising from a reaction against the early pioneering spirit of physical austerity. Likewise, mechanization and urbanization have helped to create a softer lifestyle. This has led to depreciating the value of an authentic state of well-being in favour of the easier, hedonistically-oriented "good life" propaganda. This is evidenced, for instance, in media advertising.

In the next section of this project an analysis is conducted into the philosophy of recreation espoused by Ellen White, the pioneer health advocate of the Adventist Church.

The Contribution of Ellen G. White to Exercise and Recreation

Apart from John Wesley's message of sanctification as it related to the physical being, there appear to be few religious reformers who saw more clearly than Ellen White, one's responsibility to the well-being of the human body. She was quick to realize the benefits of "perfect circulation,"[1] "deep, full inspirations of air,"[2] "vigorous exercise,"[3] "brisk walking,"[4] and "daily activity."[5]

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[1]Ellen G. White, Testimonies to the Church (Mountain View, California: Pacific Press Publishing Assn., 1948), 2:525.

[2]Ibid., p. 67.

[3]Idem, Education (Mountain view, California: Pacific Press Publishing Assn., 1903), p. 210.

[4]Idem, The Ministry of Healing (Mountain View, California: Pacific Press Publishing Assn., 1905), p. 240.

[5]Idem, Testimonies to the Church, 2:531.

Writing about one hundred years ago, in an era that manifested ignorance toward the fundamental principles of health, White said "the health of the body is to be regarded as essential for the advancement of growth in grace..."[1] Her advocacy of the natural remedy set many Christians on a course of greater rewards to both body and mind. For her "To neglect the body is to neglect the mind."[2]

While often giving specific advice to people in ill health or of sickly disposition, her natural remedies could also be adopted as a preventative to bad health. "Pure air, sunlight, abstemiousness, rest, exercise, proper diet, the use of water, trust in divine power - these are the true remedies."[3]

White's work in health reform has been termed the "entering wedge"[4] of the gospel. But it is more than a wedge. She identified Health Reform as "the right arm of the body"[5]--an indispensible part of Christian lifestyle and teaching.

Fundamental principles of health and well-being should be significant factors toward longevity, quality of life, and an effective lifestyle for Jesus Christ. White observes: "recklessness in the bodily habits reveals a recklessness in moral

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[1] Idem, Guidelines to Mental Health (Takoma Park, Washington, D.C.: Ellen G. White Estate, 1966), p. 230.

[2] Idem, Testimonies to the Church, 3:485-86.

[3] Idem, The Ministry of Healing, p. 27.

[4] Ellen G. White Counsels on Health (Mountain View, California: Pacific Press Publishing Assn., 1951), p. 434.

[5] Ibid.

character."[1] Furthermore, "... the healthful action of these faculties [of mind] are dependent upon physical health. How important then that we know how to preserve health that our duty to God and man may be performed according to His commandments."[2]

In 1900, White wrote in regard to youth and exercise:

> Without such exercise (stern and severe) the mind cannot be in working order ... he becomes like a stagnant pool. The atmosphere around him is charged with moral miasma.[3]

To a church member, White signals the importance of the power of the body over the mind. The person receiving the letter had a problem concerning suspicion and jealousy.

> You are your greatest enemy. Your wrong habits unbalance the circulation of the blood and determine [direct] the blood to the brain and then you view everything in a perverted light.[4]

A number of White's letters speak of the relationship of pure blood to a healthy brain. "The brain is the organ and instrument of the mind and controls the whole body. In order for other parts of the system to be healthy, the blood must be pure."[5] Here she refers to correct habits of eating and drinking, but in others she speaks of physical exercise as being a major contributor to clearing the blood. In her book Fundamentals of Education she offers a clear definitive statement on exercise and the human mind.

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[1] Idem, Guidelines to Mental Health, p. 230.

[2] Ibid., p. 437.

[3] Idem, Letter 103, 1900.

[4] Idem, Guidelines to Mental Health, p. 212.

[5] Idem, Counsels on Health, pp. 586-87.

"All the physical organs are the servants of the mind ... development of the entire human organism."[1]

Activity is essential to the maintenance of physical powers. To this end White states:

> All the heavenly beings are in constant activity and the Lord Jesus, in His practical life work has given an example for every man. God has established in the heavens the law of obedient action and man, his mind and body created in God's own similitude, must be active in order to fulfill his appointed place. Man is not to be idle.[2]

For those who required remedial aid, she advocated systematic exercise.

> You should move out from principle, in harmony with natural law, irrespective of feeling ... Exercise, to be of decided advantage to you, should be systematised and brought to bear upon debilitated organs that they become strengthened with use.[3]

Not only should exercise be systematic, but also cheerful. "Exercise with cheerfulness would, in many cases, prove a most effective restorer to the complaining invalid."[4] Although the last two statements are directed towards invalids, they obviously apply in a far broader context.

For White, "the proportionate taxation of the powers of mind and body are linked with one's ability to prevent impure thoughts and actions." Likewise she suggested we "conscientiously

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[1] Idem, Fundamentals of Christian Education (Nashville, Tennessee: Southern Publishing Assn., 1923), p. 426.

[2] As cited in footnote Guidelines to Mental Health, p. 75. "The law of obedient action is worthy of careful study. Action not only advances physical health but brings us into harmony with others and with the universe."

[3] Idem, Testimonies to the Church, 3:76.

[4] Ibid.

keep the commandments of God," and "love God supremely and his neighbour as himself."[1]

A sense of community responsibility and Christian relationships would seem to be implied here. The maintenance of a sound body aids the effecting of a loving concern for the neighbours in the community. She singles out a number of occupations that require mental activity and suggests revitalization through a more active life.

> Ministers, teachers, students, and other brain workers often suffer from illness as a result of severe mental taxation, unrelieved by physical exercise. What these persons need is a more active life. Strictly temperate habits combined with proper exercise, would ensure both mental and physical vigour and would give power of endurance to all brain workers.[2]

Not only does proper exercise develop endurance, but it also helps secure a character that is balanced and strong. "To secure a strong well-balanced character, both the mental and physical powers must be exercised and developed."[3] Productivity is also improved. "... physical taxation combined with mental effort keeps the mind and morals in a healthful condition, and far better work is done."[4]

The mind is more relaxed, especially when the activity is outdoor.

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[1] Idem, Guidelines to Mental Health, p. 78.

[2] Idem, Ministry of Healing, p. 238.

[3] Idem, Patriarchs and Prophets, (Mountain View California: Pacific Press Publishing Assn., 1890), p. 601.

[4] Idem, Testimonies to Ministers (Mountain View, California: Pacific Press Publishing Assn., 1923), p. 241-42.

> The whole system needs the invigorating influence of exercise in the open air. A few hours of manual labour each day would tend to renew the bodily vigour and rest and relax the mind.[1]

Since the late nineteenth and early twentieth centuries drastic changes have occurred in labour techniques. Mechanised implements have largely superceded the manual labour methods employed in the context of White's day. Many of her remarks about exercise refer to the work context as opposed to a recreative setting. For nineteenth century man, manual labour and exercise was obtained through "an education in felling trees and tilling the soil."[2] Likewise there should be little dispute concerning her statement "working the soil is one of the best kinds of employment calling the muscles into action and resting the mind."[3] This statement was made in the church school situation and was principally referring to employments. Today, economics rarely allows manual labour to be a viable proposition. (Tractors, rotary hoes, power saws and motor mowers are examples that have largely changed this situation.)

However, as evidenced in White's following remark, the principle of the need for physical exercise remains:

> The whole body is designed for action, not for inaction. If the physical powers are not taxed equally with the mental, too much strain is brought upon the latter. Unless every part of the human machinery performs its allotted tasks, the mental powers cannot be used to their highest capability for any length of time.[4]

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[1] Idem, Counsels on Health, p. 93.

[2] Idem, Testimonies to the Church, 6:179.

[3] Ibid. [4] Ibid., 5:522.

"The misuse of our physical powers shortens the period of time in which our lives can be used for the glory of God."[1] "By neglecting exercise, by overworking mind or body, we unbalance the nervous system."[2]

And so the questions remain for the modern Christian who seeks to prepare to cope with the last quarter of the twentieth century, "How may our bodies be tuned in order to best complement our mental and emotional powers? Is it possible to be physically efficient in an era of motorised golf caddies, electric tooth brushes and remote control television sets?" We may welcome the era of the padded pew, but be nonchalantly ignorant of the fact that as physical creatures, regular rejuvenation through recreation is vital to aiding mental and physical balance, and to cause the spiritual and social dimensions to be positively experienced. Indeed, in the context of the Biblical data of Chapter I, Christians should no longer disregard this dimension of their lifestyle.

White seems to have agreed in her day that "gymnasium exercises may in some instances be an advantage."[3] She did, however, express fears concerning "life-long physical injury"[4] during such activities. In this context she adds, "those who combine useful labour with study have no need of gymnastic exercises."[5]

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[1] Idem, Christ's Object Lessons (Washington D.C.: Review and Herald Publishing Assn., 1900), p. 346.

[2] Ibid. [3] Idem, Testimonies to the Church, 5:523.

[4] Ibid.

[5] Ibid.

When considering the two factors of out-door activity and of avoiding physical injury, we must then appreciate the context within which she writes. The ability to enjoy sunshine and its healthful advantages and the fresh air with its higher oxygen content are uncontested factors when analysing her remarks. "Exercise in a gymnasium, however well conducted cannot supply the place of recreation in the open air..."[1] In regard to youth and aerobic exercise "let the student take regular exercise that will cause him to breathe deep and full, taking into his lungs the pure invigorating air of heaven and he will be a new being."[2] Further she states concerning the need for aerobic exercises:

> Air, air the precious boon of heaven which all may have, will bless you with its invigorating influence if you will not refuse its entrance. Welcome it, cultivate a love for it, and it will prove a precious soother to the nerves.[3]

As referred to previously, the era in which White lived revealed that some sections of the community were sensitive about leisure and play. It is perhaps significant that she says of teachers "the question of suitable recreation for their pupils is one the teachers often find perplexing. Gymnastic exercises fill a useful place in many schools."[4] Concern is expressed about amusements with their wasteful hedonistic philosophy, and sports as "schools of brutality." "Football and boxing" are likened to "the games of Ancient Rome." In these she sees "the love of domination," "the pride of mere brute force" amid "the reckless disregard

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[1] Idem, Fundamentals of Christian Education, p. 425.

[2] Ibid. [3] Idem, Counsels on Health, p. 60.

[4] Idem, Education, p. 210. [5] Ibid.

for life,"[1] as a threat to spiritual life and physical well-being.

However, on a more positive note she says: "Amusement that serves as exercise and recreation is not to be discarded: nevertheless it must be kept strictly within bounds, else it leads to love of amusement for its own sake for selfish gratification..."[2] The context of this statement came from a deep concern expressed by White that organised matches were spoiling a recent religious revival experienced at the college.[3] Scholastic progress was also being impeded.[4] Furthermore, this revealing comment is made:

> There are persons with a diseased imagination to whom religion is a tyrant, ruling them as with a rod of iron. Such are constantly moaning over their depravity and groaning over supposed evil. Love does not exist in their hearts; a frown is ever upon their countenances. They are chilled by the innocent laugh from the youth or from anyone. They consider all recreation a sin and think that the mind must be constantly wrought up to just such a stern severe pitch.[5]

It is refreshing to have Ellen White endorse the need for a more joyous and positive regard toward life. It would appear that a number of Christians were so worried about wrong actions that they were frightened into indecision and inactivity.

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[1] Ibid.

[2] Ellen G. White to W. W. Prescott, 25 October 1893, Letter P-47, 1893, Ellen G. White Research Centre, Avondale College, Cooranbong, N.S.W., p. 7.

[3] Idem, Selected Messages 1 (Washington D.C.: Review and Herald Publishing Assn., 1958), pp. 129-43.

[4] Idem, Fundamentals of Christian Education, pp. 225, 228-29, 379.

[5] Idem, Testimonies to the Church, 1:565.

The location of a home or school should not be determined by social or economic factors alone. Opportunities for recreation should receive high priority. While the following statement speaks primarily to rural localities where cultivation and tree-felling is paramount, true recreation, in White's mind is stated thus:

> With the question of recreation, the surroundings of the home and the school have much to do .... Those with whom mental and physical well-being is of greater moment than money, or the claims and customs of society should seek for their children the benefit of nature's teaching and recreation amidst her surroundings.[1]

In summary, Ellen White reveals some simple basic principles. Recreation for the Christian, above all should prepare us to be better coping and better relating witnesses for Jesus Christ. To this end she writes:

> We can and should conduct our recreation in such a manner that we shall be fitted for the more successful discharge of the duties evolving around us, and that our influence shall be more beneficial upon those with whom we associate.[2]

For her, recreation did not commence with folly and end with vanity. On the contrary, she said, while addressing about two hundred people at a recreational meeting at Battle Creek:

> We want to seek the elevated and lovely. We want to direct the mind away from those things that are superficial and of no importance, that have no solidarity. What we desire is to be gathering new strength from all that we engage in. From all these gatherings for the purpose of recreation, from all these pleasant associations, we want to gather new strength, to become better men and women. From every source possible we want to gather new courage, new strength, new power ...[3]

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[1] Idem, Counsels on Health, pp. 190-92.

[2] Idem, Testimonies to the Church, 2:586.

[3] Ibid., p. 587.

Human beings function as a whole. What effects one part of the person is reflected in the rest of that person. As the body affects the functioning of the mind, so the inefficient mind can be the result of a poorly exercised physical condition. "Inactivity is a fruitful cause of disease,"[1] and "Exercise would in many cases be better for the health than medicine."[2]

Perhaps the most telling statement concerning physical recreation is found in White's words "More people die for want of exercise than through overfatigue; very many more rust out than wear out."[3]

Conclusion

In this chapter a progression of thought has been observed concerning physical exercise. It would seem apparent that both Australia and the United States as advanced nations have still yet to realise the full impact of the effects of regular aerobic exercise and improved mental and physical efficiency.

In Chapter 3 a definition of aerobic recreation is offered for the enabling of improved psychological well-being. Some psychological and biochemical evidence is also included to support the view that there is a relationship between the body's efficiency and aerobic exercise.

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[1] Idem, Ministry of Healing, p. 238.

[2] Ibid., p. 240.

[3] Idem, Counsels on Health, p. 173.

CHAPTER III

SCIENTIFIC EVIDENCES FOR THE RELATIONSHIP BETWEEN AEROBIC RECREATION AND IMPROVED WELL-BEING

Defining Recreation

According to an authoritative dictionary, recreation is defined as "the action of recreating (oneself or another) or fact of being recreated by some pleasant occupation, pastime or amusement."[1]

Ellen White describes recreation as follows:

> Recreation, when true to its name, re-creation, tends to strengthen and build up. Calling us aside from our ordinary cares and occupations, it affords refreshment for mind and body and thus enables us to return with new vigour to the earnest work of life.[2]

Hard mental and physical work, a vital ingredient for an honest and satisfying life, may have been considered by some of our forefathers as a qualification for eternal reward. This has been the view of Csikszentmihalyi and others. Csikszentmihalyi says:

> Whereas work had traditionally been considered as a painful but necessary task, necessary for survival and for reaping the fruits of leisure, the Protestant Reformation slowly redefined work as the main purpose of life. It did so because it made a convincing symbolic connection between hard work and the proof of eternal salvation. Before the reformation men were pursuing two major unrelated goals; the first was to achieve material

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[1] The Shorter Oxford English Dictionary, 3d ed. (Oxford: Clarendon Press, 1973), 2:1768.

[2] White, Education, p. 207.

> comfort; the second was to reach the ultimate contentment of knowing that everlasting peace was waiting for them in the after life. After Calvin, however, it became possible to redefine the two activities as mutually supportive: success in worldly affairs became a sign of election to eternal life.[1]

The result, says Csikszentmihalyi, was that hard work was even more justified as it aided in an eternal reward. If fewer leisure hours and less material comfort were to be the Puritan's experience, the experience of having a job well done was sufficient reason for self-imposed measures of austerity.[2] While it might seem unfair to endorse unconditionally Csikszentmihalyi's concept of Calvin as a general statement of fact, there does appear to be an element amongst the Christian community that subscribes to hard work and eternal election as being virtually synonymous. Work was "what we have to do most of the time against our desire; [while

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[1] Mihalyi Csikszentmihalyi, Beyond Boredom and Anxiety (San Fransisco: Jossey-Bass, 1977), p. 186.

[2] Csikszentmihalyi cites Weber to support this idea: "From Weber's analysis, however, it appears that the hope for eternal life was a plausible excuse for reorienting people's energies, rather than the literal end of their activities. Salvation served as a goal in the same sense that the top of a mountain is the goal that helps to focus a climber's actions, or that curing a patient provides closure to the surgeon. The real contribution of the protestant ethic was to offer a consistent set of rules, with clear means and clear feedback, by which the believer could order his life and avoid boredom and anxiety. In Weber's words: 'To attain ... self-confidence intense worldly activity is recommended as the most suitable means. It and it alone disperses religious doubts and gives the certainty of grace.' And again: 'The moral conduct of the average man was thus deprived of its planless and unsystematic character and subjected to a consistent method for conduct as a whole.' According to Richard Baxter, the early Puritan writer, the modern specialized worker 'will carry out his work in order while another remains in constant confusion, and his business knows neither time nor place.'" Ibid., p. 187.

leisure was] what we like to do although it is useless."[1] There is little wonder that feelings of boredom and frustration existed in the work-place, and that feelings of guilt persisted when at leisure. Pleasure of any sort was usually discouraged.

Csikszentmihalyi would see work as in the Protestant work ethic as another type of "game" when redefined with a logical set of goals and means. He remarks:

> It is ironic that the followers of this doctrine should have condemned all forms of enjoyment, whereas - at least according to our interpretation - they must have been enjoying the very rigors of their ascetic way of life.[2]

Recreation and Enjoyment

Activities today that assume a joyful expression are viewed by some hard-working, conservatively-minded peopl as being,

> hedonistic and decadent. Enjoyment is suspect; work is godly. It is very difficult for these people to realise, let alone admit that the serious work they do is more enjoyable <u>for them</u> than any form of leisure could be.[3]

Joy is a basic expression to all life's fulfilment in the here and hereafter. To deny it in either work, recreation or worship, makes a travesty to life's original meaning.

A warning must be given here, however. Fulfilment through joy in participation must aid in the reality of being part of something larger than oneself. The recreation experience should enhance personal and social relationships. Providing play or amusement as a <u>distraction</u> to life's meaning or purpose is fruitless. The Lydians were unable to cure hunger by offering playful contests.

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[1] Csikszentmihalyi, p. 3.

[2] Ibid., p. 187. [3] Ibid. (Italics supplied).

The Roman Emperors could not remove popular restlessness by providing circus games. Joy is a necessary element in experiencing satisfaction and fulfilment whether at work or recreation (or "play" as is popularly referred to by psychologists). Intrinsic rewards are vital to well-being.[1] This element should be experienced in participation as well as spectatorism.

There are many examples of why enjoyment is essential in recreation. One of the world's best known milers, Herb Elliot, once stated: "Training was sheer agony because I knew it had to hurt if I wanted to win."[2]

Gary Eggers remarks of Elliot:

> After his world record mile in Rome in 1960 Elliot instantly quit running and relished the 'good life'--eating, drinking and smoking. Some years later he became concerned about his weight and general fitness level and started to run again. But hurting was all he knew when he ran, so subconsciously Elliot was competing with himself--until he realised the madness of this and forced himself to slow down. "Suddenly I found that running itself was enjoyable," say Elliot. "Without the motivation to win there was a motivation to run for the sheer pleasure that will probably keep me running for the rest of my days."[3]

Mervyn Hardinge supports this concept of the importance of enjoyment in exercise. In an experiment conducted at Loma Linda University, blood cholesterol was examined in a series of tests on medical students involved in various aerobic exercise programmes. Some programmes were enjoyed, others disliked.

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[1] Ibid., p. 199. For further discussion see Appendix 4.

[2] Gary Eggers, Sport and Drug Addiction (Unpublished Manuscript, Department of Youth, Sport and Recreation, N.S.W. Health Commission, 1981), p. 21.

[3] Ibid.

Hardinge discovered that the enjoyable exercise programmes reduced cholesterol levels significantly but that the effects of the disliked programmes held cholesterol at a constant level. Of this experiment Hardinge remarks: "The conclusion is obvious. You must enjoy your leisure time to derive the most benefit. Your exercise must be vigorous, but not one which causes tension or excessive drive."[1]

With the advent of the shorter working week, the Church whether at worship, witness or recreation, should be seen to relate itself to restoring and maintaining physical and mental capacities in order to function effectively as the body of Christ.

Annie Von Tungeln, citing leisure as "the loveliest of vessels"[2] suggests that spare time can be a blessing to the active or a curse to the idle.[3]

David Grayson has said: "Contentment and usefulness comes as an infallible result of ... surrendering ourselves to the fulness of life--of letting life flow through us."[4] Yet, leisure is not to be equated with idleness or "vegetative loafing." Von Tungeln remarks, "Some people are so steeped in the work ethic as espoused by Thomas Carlyle the philosopher of the Industrial Revolution--

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[1]Mervyn G. Hardinge, A Philosophy of Health (Loma Linda, California: School of Health, Loma Linda University, 1978), pp. 34, 35.

[2]Annie L. Von Tungeln, "Leisure--A Personal Challenge," Your Life and Health, April 1980, p. 28.

[3]Von Tungeln cautions people in their spare time to be more industrious than those who wake up in the morning with nothing to do and go to bed with it half done.

[4]Quoted in Von Tungeln, p. 28.

'work is alone noble'--that they feel guilty about enjoying leisure."[1] Leisure is a time for personal and social development. It is a time for relaxation and recreation. Those who choose not to be involved in active physical pursuits may experience non-fulfilment and increased vulnerability toward desirable thought and action. This is particularly relevant for persons involved in sedentary or stressful occupations.

Recreation is assuming increased prominence in people's minds as:

> a vehicle capable of positively influencing the self-image of participants, as a tool for rehabilitation, as a social means to reduction in racism, and as a means by which people can enhance the quality of their lives by satisfying many of their basic personal needs through involvement in leisure pursuits.[2]

Recreation should contribute to healthy personal adjustment, relaxation and enjoyment. This may occur during the activity or immediately following involvement in that activity. Preferably, this experience should occur, to some extent, in both situations. It should not contribute to negative physical or mental effects,[3] neither should it develop or stimulate depressive attitudes or fanatical tendencies.

Graham and Klar suggest that inward psychological focus is helpful in analysing the effects on emotion during recreation.

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[1] Ibid.

[2] Peter J. Graham and Lawrence R. Klar, Planning and Delivering Leisure Services (Dubuque, Iowa: Wm. C. Brown and Co., 1979), p. xi.

[3] See Appendix 5 for a discussion on "Positive and Negative Effect."

They suggest that, "it is what occurs within an individual which determines whether or not recreation occurs."[1] Acceptance, the development of positive self-image, and a genuine pleasure in living are just some of the benefits often experienced.[2] As a result of participating with others in a non-threatening environment, prejudices created by social class distinction and religion may also be eliminated.

Goal Fulfilment in Recreation

To be effective recreation needs some challenge, purpose and direction. This may be achieved through the setting up of intra-personal goals conducive to well-being. In contrast, "big sport" exploits intense inter-personal competition;[3] causing its participants to seek to win at all costs irrespective of other considerations. One of the objectionable types of competition, says Brian Start, is "...a 'spoiling' element whereby the performance of one of the competitors can be reduced by the other,

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[1] Graham and Klar, p. 6.

[2] David Gray and Donald Pelegrino, Reflections on the Recreation and Parks Movement (Dubuque, Iowa: Wm. C. Brown and Co., 1973), p. 6.

[3] Glasser observes the differing outlooks to competition between Western and Eastern civilisation: "Western man, who is raised to be competitive, to be concerned with winning, finds it very difficult not only to compete with others but not to go into competition with himself, to set goals, to time himself, to keep close tabs on his self-improvement. In our culture these are all highly desirable traits but traits which unfortunately seem to lead to high blood pressure and heart disease especially when we have some difficulty reaching our self-set goals. William Glasser, Positive Addiction (New York: Harper and Row, 1976), p. 58.

thereby altering the difference between the competing segments such as tennis or football."[1]

Public prizes and other rewards have a tendency to erode the altruistic ideals of the recreative process. Participants may feel anxiety and experience relationship antagonism. Tension and stress can be increased, and the serenity and personal joy so beneficial to the recreative experience thwarted. It is therefore suggested that reward systems where prizes and commendations are offered should be carefully monitored.

In writing about lifestyle problems Cary Cooper cites Dyer's[2] philosophy on goals concerning psychological immobility stating that:

> an individual must be able to identify the problem areas, or internalised lifestyle patterns that are preventing him or

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[1]Brian Start, "Competitive Behaviour and Stress Illness," The Australian Journal for Health, Physical Education and Recreation no. 92 (Winter 1981), p. 3. Brian Start observes of the concept of competition that there is a problem in a "person's immoderate, bizarre and even pathological interpretation of competition..." This may well be seen in various personality's poor experiences during interaction with others in an atmosphere of competitiveness. Of persons of type 'A' personality, Start says:

> [They] are very industrious with fiercely competitive and work-oriented behaviour....Importantly, in areas not connected with 'A' type's work or area on which his self-concept depends, often there is little aggressive competition behaviour to be perceived. He is really disinterested in these areas. He does not get involved. He can be charmingly apathetic. He only rises to a bait if the bait is associated with his status area. However, the latency for the behaviour is well established and response ruthlessly excessive.

Start regards the 'B' type person as one who views his so-called competitors as friends and a lesser threat relationally than the 'A' type person. Ibid., pp. 4-7.

[2]Author of Your Erroneous Zones (1976).

> her from achieving important life goals, and then cut through the lifetime of emotional red tape by changing behaviour and redesigning these patterns.[1]

The question should be asked of one's recreation, "Why am I doing this?" and "How can this help me to be an effective person in my relationship to Christ and to others?"

Mihaly Csikszentmihalyi likewise sees one of the key factors to fulfilment in recreation in its autotelic[2] nature. When life is an ordered unified activity with manageable challenges and purposeful goals, a certain type of "flow"[3] and control is gained over life. Authentic recreation aids in the development of abilities to act adequately. Inner skills and outer challenges must be in balance before one experiences fulfilment. Csikszentmihalyi describes the principle of "flow" as <u>the wholistic sensation that people feel when they act with total involvement</u>."[4] He further defines flow as a state in which:

> action follows upon action according to an internal logic that seems to need no conscious intervention by the actor. He experiences it as a unified flowing from one moment to the next, in which he is in control of his actions, and in which there is little distinction between self and environment between stimulus and response, or between past, present and future.[5]

True recreational exercise should be, and be seen to be transcending negative self-criticism. It should not be a means

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[1] Cary L. Cooper, <u>The Stress Check</u> (New Jersey: Prentice-Hall Inc., 1981), p. 111.

[2] From the Greek "auto"--self and "telos"--goal or purpose. Csikszentmihalyi, p. 10.

[3] See Appendix 6 for a discussion on Csikszentmihalyi's concept of flow.

[4] Csikszentmihalyi, p. 36. [5] Ibid.

through which a person experiences degradation and limitation. Recreational exercise may be opened to measurement and goal-setting intrapersonally but alienation, loss of control, and lack of meaning should never be felt as a result. Experiencing something is at least as important as achieving it. Good health should transcend striving and performing against others.

True recreation should not be confused with 'sport' as seen in organised or 'Big Sport.' Dr. Kent Pearson remarks of young people, "...Youth, far from being exposed to desirable moral virtues are exposed to dishonourable learning experiences."[1] Sport and competitive athletics tend to superimpose the pleasure of playing on the pleasure of spectacle. Success is transferred to coaches. Sport becomes big business. As Eggers observes, "And like workers, many modern athletes have become machines, oriented towards goals irrespective of means."[2] Such goals often show themselves to be the ultimate in egotistical and hedonistic pursuit, culminating at best in bad sportsmanship, and at worst, brutality and violence.

In concluding this section on goals some basic restraints are offered for consideration:

(a) When evaluating recreative programmes, subjectivity will underly all measurement in the sociological and psychological arenas.

(b) Philosophy of life, basic assumptions about human nature, and man's relationship to God as His image, albeit a

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[1]Quoted in Eggers, p. 20. [2]Ibid., p. 13.

broken image, also influence results of measurement, goals and objectives.

Social Participation in Recreation

In the initial stages of developing a programme of recreation, the stimulus of other people often provides incentive and motivation to continue. The individual personality of each participant and his attitude to himself may predetermine his desire to join or remain solo in his activity.

There are some valuable advantages in families sharing exercise programmes together. These are dependent, however, on each individual obtaining a satisfying experience through exertion with each person possibly requiring their own independent programme as well.[1] In a survey which interviewed 1,510 people about physical fitness, it was observed that the family was a neglected but vital medium for recreational activities, and that children tended to take up the activities in which their parents participated.[2]

Norman Bradburn observes concerning social participation:

> On the average, then we would expect that those who have a high degree of social interaction would be more likely to have a high degree of positive sentiment toward many individuals. The perception of common interests, values, and beliefs leads to the development of positive sentiment, and increases the liking between individuals.[3]

He concludes:

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[1] Sue Petersen, "A Running Partnership," The Runner, June 1980, p. 22.

[2] Summary of Harris's Perrier Survey of Fitness In America in "Running Battle," Time, 5 February 1979, p. 58.

[3] Bradburn, p. 128.

> Those who feel good may be more likely to engage in social activities, and engaging in those activities may increase the probability that they will encounter the kinds of experiences productive to positive effect, which in turn may make them more disposed toward engaging in further activities.[1]

The participation by social groups in tennis, squash, swimming, basketball, and cricket, to name just a few, can help provide an interaction that unifies and expands the sphere of relationships in cordial and non-threatening situations. Jogging also is a most enjoyable experience when experienced as a group activity. Insel, Roth and Kenefict remark:

> ... group jogging can be socially gratifying and also a powerful stimulus for continued participation. In addition, group jogging can serve as a protective shield against derisive remarks of unthinking pedestrians who find the sight of a middle-aged man or woman jogging alongside the highway amusing. Furthermore, the group tends not only to encourage continued participation but to disapprove of absenteeism.[2]

Of greater significance is the quality of relationship that can be achieved. Close relationships of trust and sensitivity have been observed over the years by the writer, which have led some people to be influenced to make decisions affecting their eternal destiny.[3]

Here are some basic areas in which recreation can affect people in determining positive effects on their well-being.

1. Recreation can aid in the development of a sound body and its integration with the development of a sound mind

2. Recreation can aid in character development

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[1] Ibid., p. 146.

[2] Paul M. Insel, Walton T. Roth, and Madeleine Kenefict, "Jogging, An Antidote to Tension," Life & Health, January 1977, pp. 20, 21.

[3] For an illustration of this type of change see Appendix 7.

3. Recreation can enhance one's appreciation of life and environment

4. Recreation can aid in the reduction of social, cultural, and religious barriers

5. Recreation can aid the development of responsive and responsible citizens

6. Recreation can aid in the development of a homeostatic state which equips that person to be a better coping entity

Those engaged in aerobic recreation along the suggestions previously outlined, will find it easier to meet challenges, explore possibilities and attempt more difficult exploits for Christ and the Church in a positive manner because of the higher experience of well-being within the context of Calvary.

The Choice

Quality of life is directly related to quality of health. "When health is absent" wrote Herophilus, the physicial to Alexander the Great, "wisdom cannot reveal itself, art cannot become manifest, strength cannot fight, wealch becomes useless, and intelligence cannot be applied."[1] In a sense it could be said, that "your lifestyle is you"[2] and that "you are the only person in the world who can do what is necessary to become healthy and

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[1]Quoted in George Sheehan, "The New Frontier," in The Complete Runner by the editors of Runner's World (Mountain View, California: World Publications, 1974), p. 3.

[2]John McCamy and James Presley, Human Life Styling (New York: Harper and Row, 1977), p. 1.

happy."[1] William Glasser suggests: "Very few of us realise how much we choose the misery in our lives."[2] He further states: "Most of us spend our lives in a series of compromises between doing what we believe in, and doing what will please those who are important to us. Happiness depends a great deal on gaining enough strength to live with a minimum of these compromises."[3] To find this happiness we need, in Glasser's words, to find: "(1) What to do, (2) How to do it, and (3) Where to get the strength to get it done."[4]

It would now seem that "every major degenerative disease is fully predictable and preventable in its first decade of development."[5] Symptoms appear quite often, long before clinical disease is manifested. In this regard, McCamy and Presley state: "Resistance factors are positive, the things you can do to improve your health and well-being. Susceptibility factors are negative, the things you must avoid to keep from degenerating."[6] In an era when tensions appear to be increasing, disease may be prevented or delayed by methodically changing your lifestyle.[7]

Today exercise is a significant factor included on most medical health lists.[8] McCamy and Presley argue that persons who regularly exercise aerobically through rowing, jogging, sustained walking, swimming or cycling can lower their risks of dying

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[1]Ibid., p. 2. [2]Glasser, p. 1. [3]Ibid., p. 3.

[4]Ibid., p. 4. [5]McCamy and Presley, p. 3. [6]Ibid., p. 14.

[7]See Appendix 8.

[8]For a typical medical health survey see Appendix 9.

prematurely up to one hundred times. They also observe, "It is becoming clearer that exercise is probably the top resistance factor in warding off cancer."[1]

Burnout

Many people, particularly in the business and professional world, are heading for "burnout," says Lance Morrow:

> Today, burnout is a syndrome verging on a trend ... the smell of psychological wiring on fire is everywhere ... Burnout is progressive, occuring over a period of time. Authors Robert Veninga and James Spradley define five stages that lead from a stressful job to a burnt-out case: 1) The Honeymoon--intense enthusiasm and job satisfaction that, for all but a few dynamos, eventually gives way to a time when valuable energy reserves begin to drain off. 2) Fuel Shortage--fatigue, sleep disturbances, possibly some escapist drinking or shopping binges and other early-warning signals. 3) Chronic Symptoms--exhaustion, physical illness, acute anger and depression. 4) Crisis--illness that may become incapacitating, deep pessimism, self-doubt, obsession with one's own problems. 5) Hitting the wall--career and life threatened.[2]

An increasing number of Australians are suffering from physiological and psychological disorders, with many instances of premature retirement due to various forms of mental distress.[3]

Members of the Christian community will not escape burnout should they wilfully or inadvertantly disregard nature's basic laws of physical maintenance and rejuvenation. The effectiveness of our "psychological wiring," while largely dependant on mental

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[1] McCamy and Presley, p. 29.

[2] Lance Morrow, "The Burnout of Almost Everyone," Time (21 September 1981), p. 90.

[3] See Appendix 10.

health and hygiene, cannot be divorced from the reality that man is psychosomatic.[1]

Illness is often related to stress.[2] It is caused by the inabilty to cope with severe or prolonged negative changes in well-being.[3]

For recreation to be of real benefit to people, it is vital that its focus should be on the whole person. Body, mind and spirit should be looked at as being integrated in a wholistic setting which is independent of, and greater than, the sum of its parts.[4] This view is held by people involved in the establishment and maintenance of Wholistic Health Centres and by many other professionals dedicated to the philosophy of preventative medicine. The focus is on the whole person, his physiological and psychological well-being.

There is little dispute concerning the view that our feelings and emotions are the direct result of our thinking.[5] If

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[1]Brian Start observes that as late as 1973 U.S. Medical authorities were unwilling to include emotional problems as part of the cause of ischemic heart disease. Australian hospitals took a further six years to accept this. Start, p. 3.

[2]Cooper, p. 119. Cooper states that: "Correlational studies suggest a relationship between life-change scores and the onset of tuberculosis, heart disease, skin disease, and hernia, a general deterioration in health, and poorer academic performance."

[3]As a yardstick for personal stress Thomas H. Holmes, and Richard Rahe developed a social readjustment rating scale which has proved to have grim usefulness as a tool for predicting stress-related illness. The higher the score annually, the greater the likelihood of illness. See Appendix 11.

[4]Donald A. Tubesing, Wholistic Health (New York: Human Sciences Press, 1979), p. 89.

[5]See Appendix 12.

you think negatively about yourself, you will develop negative feelings; conversely, if you think positively about yourself, you will begin to feel positively. Brian J. Sharkey suggests that "mental health may be defined as feeling good about yourself and life in general." If "regular moderate exercise feels good,"[1] then it is probable that one will feel better about himself.

Some Psychological Effects of Aerobic Recreation

If our personal state has a significant effect on others, and the way they respond has an effect on our well-being, the question can be asked: Does an improvement in physical fitness influence our self-concept? According to Sharkey:

> The most notable change, as expected, is found in the physical self, or body image. When you lose weight and improve muscular strength, endurance, aerobic fitness, and appearance, you feel better about your body. This new confidence could influence personality traits or other aspects of your self-concept. When middle-aged male subjects in a research study discussed the influence of a fitness program on their personal lives, many volunteered that they had experienced an improvement in their sex lives. As fitness improves, body image is enhanced and confidence in the body can be an important step to improved personal relationships.[2]

William Glasser, in speaking of experiences of people transferring from "negative addiction"[3] to "positive

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[1]Brian J. Sharkey, Physiology of Fitness (Champaign, Illinois: Human Kinetic Publishers, 1979), p. 198.

[2]Ibid., p. 202.

[3]Peele and Brodsky describe "negative addiction" as a major form of degradation and limitation. Addiction was once considered to be a biochemical problem but Peele observes "... if addiction is now known not to be primarily a matter of drug chemistry or body chemistry, and if we therefore have to broaden our conception of dependence--creating objects to include a wider range of things, then why stop with drugs? Why not look at the

addiction,"[1] has suggested that positive addiction occurs when the mind is able to conceive of more options, solve more problems, become more imaginative and creative, and generally has more strength to cope with day to day difficulties. He further sees aerobic exercise as in jogging, as the "hardest but surest way..."[2] He states: "Running, perhaps because it is our most basic solitary survival activity, produces the non-self-critical state more effectively than any other practice."[3] Sharkey in agreeing with Glasser further remarks:

> Since I've become a runner, I feel more confident and effective, and I've been more successful. Is all that just a happy coincidence, or is it evidence of the effect of exercise and fitness on my mental health?[4]

In commenting on jogging's effect on relieving tension, Insel, Roth and Kenefict state:

> Jogging has been shown to relieve some or all of the psychological symptoms associated with tension, such as irritability, touchiness, moodiness and depression. In an observational study of thirty regular joggers, most of whom are health professionals, 75 percent said jogging increased a feeling of well-being in them.[5]

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whole range of things, activities and even people to which we can and do become addicted." Peele and Brodsky, p. 3. See Appendix 13.

[1] Glasser p. 2. [2] Ibid., p. 100.

[3] Ibid., p. 122, 123.

[4] Sharkey, p. 207.

[5] Insel, Roth and Kenefict, p. 19. In citing some of those observed, one remarked that he felt no need for his evening scotch and water if he exercised in the afternoon. Another claimed that he was able to think more clearly and felt less tired than on days he missed his jogging. Still another said he was less affected by colds and flu when he jogged regularly. Ibid., p. 20.

Medical science links aerobic exercise with such benefits as "improved circulation and respiration; reduced risk of heart disease; improved fat metabolism; reduced body weight; strengthened bones, ligaments, tendons..."[1] More recently, aerobic exercise has been found to transform personality, enhance self-concept and body image, reduce tension and distress, and facilitate emotional stability."[2] Says Dennis Colacino "It [aerobic exercise] gives people a better self-image, it helps one's self-esteem, it sharpens one's competitive edge."[3]

Lowell Cooper, in reviewing the psychological effects of exercise, comments that few attempts have been made to compare the personalities of those who engage in athletic events and those who do not. In a study of college and high school athletes, Cooper records that athletes were:

1. More outgoing and socially confident
2. More aggressive, dominant and leading
3. Higher in social adjustment
4. Higher in prestige and status
5. Strong competitors
6. Less anxious
7. More emotionally stable
8. Less compulsive
9. Greater tolerance of physical pain[4]

Physical exercise appears to give people the oppotunity to determine the psychological benefits of their body's capabilities and

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[1]Sharkey, p. 3. [2]Ibid.

[2]"America Shapes Up," p. 89.

[3]Lowell Cooper, "Athletics, Activity and Personality: A Review of the Literature," The Research Quarterly 40 (February 1969): 19.

the pleasure they can derive and express through various motor activities.

While personality has never been defined or measured, Cattell suggests that "one's personality indicates what he will do when he is in a given mood and placed in a given situation."[1] In a study conducted by Ismail and Trachtman[2] at Purdue University, scores were correlated from the Cattell Personality Factor Questionnaire completed at the start and finish of a four month test. See Table 1.

Table 1

	High-Fitness Group		Low-Fitness Group	
	Before	After	Before	After
Emotional Stability	6.4	6.1	4.6	5.4
Imagination	7.3	7.2	5.3	6.1
Self-Sufficiency	6.5	6.6	6.4	8.0
Guilt-Proneness*	4.2	4.1	5.4	6.1

*Lower scores on "guilt-proneness" indicated increased self-assurance.

In this study, emotional stability, imaginative ability, and self-worth were all found to improve in persons of low fitness as they improved their aerobic efficiency. Among the high fitness group there was little significant change in these areas indicating that there is a possible plateau effect in well-being among physically fit people. This may be interpreted to mean that a certain

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[1] Cited in Sharkey, p. 201.

[2] A. H. Ismail and L. E. Trachtman, "Jogging the Imagination," Psychology Today 6(March 1973): 78-82.

emotional stability is often improved in many who have developed superior physical fitness.[1]

Alan Jacobs, a Chicago psychotherapist who runs daily, observes that running causes "a person to cope better with tension and anxiety."[2] It lowers blood pressure and heart rate and promotes more efficient bodily function. Because of less pressure on your body, mental function becomes more effective. Just as a banker understands that to make money one has to spend money, it is also true for energy. A person who exercises receives more than he expends and one of the advantages of exercise is that it releases positive instincts that would otherwise remain inhibited.

Some Biochemical Effects of Aerobic Exercise

According to Robert I. Levy, in a summary on the current information on cholesterol,[3] a certain form of cholesterol, HDL (High density lipoprotein), has been found to be a significant factor associated with reduced cariovascular disease.[4] He states: "it has been shown that moderate-to-vigorous regular exercise is associated with increased HDL..."[5], thus providing further clincial evidence of the need for aerobic exercise to aid in maintaining physical well-being.

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[1]Glasser, pp. 47-9. [2]Cited in Shyne, pp. 27-28.

[3]Robert I. Levy, "Review: Cholesterol, Lipoproteins, Apoproteins, and Heart Disease: Present Status and Future Prospects," Clinical Chemistry 27(May 1981): 653-62.

[4]Ibid., p. 655. Higher concentrations of HDL Cholesterol correlate with less cardiovascular disease. Lower concentrations of HDL are associated with factors including obesity, contraceptive tablets, very high carbohydrate diets and cigarette smoking.

[5]Ibid., p. 656.

A study by Otto Appenzeller on the level of catecholamines (hormones found in decreased amounts of depressed people) showed that marathon runners' levels increased up to 600 percent by the end of the run. Appenzeller conducted a further study on the effects of running on endogenous opioids (biochemicals located in the brain that relate to pain and mood). Beta-endorphin, a widely occurring painkiller in the body was found to increase up to 100 percent on marathoners at high altitude. These substances continued in the blood stream for several hours after. The levels of Vitamin C, considered a valuable stress vitamin, also rose during the run.[1]

In the last few years there has been considerable discussion about the merits of various forms of exercise. As already noted in this chapter, a number of psychologists and psychiatrists suggest that distance or endurance exercise in the form of running or jogging is as effective as any other type of exercise.

Some older people would argue that their work (i.e. gardening, housework, or physical labour), provides sufficient exercise to maintain their bodies in a fit condition. This may be valid, but only if it meets the basic conditions in defining authentic recreation. The best forms of aerobic exercise or recreation are those which usually cause most physical exertion. Persons under thirty, may freely engage in such exertion on a regular basis. People over the age of thirty, who have clearances from medical practitioners, or who show no signs or symptoms of

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[1] See Appendix 14 for a full text on these findings.

chronic disease, may also engage in exertion, providing they observe the correct procedures for warm-up, engagement, and shut-down in physical programmes.[1]

One of the most up-to-date consensus reports on the effects of various types of exercise on fitness and well-being is contained in C. Carson Conrad's article, "Does Your Favourite Exercise Keep You Fit?[2] Seven experts on physical fitness combined their views on fourteen forms of exercise.[3] These experts (and others) generally agree that jogging was as effective as any other form of aerobic activity, in order to obtain maximal energy expenditure, cardiorespiratory endurance, (stamina), muscular strength, weight control, digestion and sleep.[4] A summary of these findings is stated in "A quick scorecard on fourteen sports and exercises."[5] Other beneficial aerobic exercises in order of effectiveness include rowing, bicycling, swimming, ice-skating, squash, skiing, basketball, and tennis.[6] Walking, when calculated at 3.75 m.p.h.

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[1] See Appendix 15 "What You Should Know About Exercise?"

[2] C. Carson Conrad. "Does Your Exercise Keep You Fit," Your Life and Health, February 1982, pp. 16-21. (A full report of this text appears in Appendix 16.)

[3] These included: Samuel M. Fox III, Evalyn S. Gendel, Warren R. Guild, Theodore G. Klumpp, Hans Kraus, Lawrence E. Lamb, and Allan J. Ryan.

[4] S. M. Fox, J. P. Naughton, and P. A. Gorman, "Physical Activity and Cardiovascular Health. III The Exercise Prescription; Frequency and Type of Activity." Modern Concepts of Cardiovascular Disease, (June, 1972). Cited in Hal Higdon, Fitness Over Forty (Mountain View, California: World Publications, 1977), pp. 82-4.

[5] See Appendix 17. [6] See Appendix 18.

was found to be in terms of energy exerted, one third as effective as jogging at 10 m.p.h.[1]

The ease of conducting a programme of aerobic exercise is determined largely by the setting in which it is to be performed, and the equipment required to perform it. When considering outdoor exercise, brisk walking could be regarded as the easiest to perform. Ellen White extolled the virtues of brisk walking. She stated: "There is no exercise that will prove as beneficial to every part of the body as walking."[2] Medical science knows of many exercises that develop various portions of the body more effectively, walking being helpful to limbs below the waist. It is also a proven exercise for relaxation particularly for those in the older age category. White also said, "Perfect health depends upon perfect circulation."[3] Vigorous exercise best aids improved circulation for those in a position to do so without threatening their physiological safety.[4]

Conclusion

In this chapter an attempt has been made to survey aspects of recreation and work, and the benefits of aerobic exercise to general well-being. Effective recreation should contain such

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[1] See Appendix 19.

[2] Ellen G. White, Healthful Living (Battle Creek, Michigan: Medical Missionary Board, 1898), p. 130.

[3] White, Testimonies to the Church, 2:531.

[4] In order to avoid injury when jogging, for instance, footwear specially designed for the occasion is most important.

factors as enjoyment, relaxation, intrapersonal goals, social development, and fellowship.[1]

Both during and after aerobic exercise psychological and physiological benefits may be experienced. The quantity and quality will largely determine the benefits that can be derived. Csikszentmihalyi, Glasser and others, have seen merit in the experience of "flow" and the development of a state of positive addiction. Should such experiences become an end in themselves psychologically crippling and negative addiction may result. This may occur in some marathon runners or persons with susceptible personalities who find escape from family responsibility or other problems by spending excessive amounts of time on the road or in the gymnasium.

As a means to an end, however, aerobic exercise provides a valuable change of pace or respite from tensions, anxiety or boredom. It can facilitate a different world of experience, literally offering breathing space in reassessing approaches to challenging or difficult situations. In comparing negative addiction (such as alcohol) George Sheehan remarks, "...the hour on the roads (for instance) provides the altered state of consciousness that alcohol supplies so fleetingly."[2]

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[1] "The word fellowship means participation, partnership." White, Fundamentals of Christian Education, p. 476.

[2] Cited in Eggers, p. 3. In achieving reasonable standards of physical well-being, it does not appear necessary for most people to spend more than an average of half an hour daily in vigorous exercise.

True recreation can provide an alternative "positive high." It is controlled, predictable, and unlike any drug-induced state, is a solution that does not become a problem.

CHAPTER IV

THE PROJECT IMPLEMENTED

Introduction: A Review

In reviewing the theological, historical and scientific data presented so far, it has become apparent that the tangible benefits through aerobic exercise are being neglected by both the individual and the community. An examination of biblical literature and the writings of Ellen G. White emphasized the sacred relationship between the physical and spiritual nature of man. (This sharply contrasted with the alienating dualism of Platonic thought which placed scant value on caring for human flesh.) The body was not vile. It was God's temple of the Holy Spirit. Jesus saw man as an entity in which wholeness was the key to his effective function. Paul extended the wholeness of individual body to encompass the Christian community.

Chapter three commenced with some contrasting factors between work and recreation. Aerobic recreation was defined as the action of being recreated by some pleasant occupation that strengthens and builds up giving refreshment for body and mind. Factors aiding this process were enjoyment, relaxation, fulfilment, purpose, and challenge. Social and medical science is now beginning to amass evidence for the psychological as well as physiological benefits of exercise on man's total well-being.

The Design

As a result of this research the writer designed a project to examine the view that aerobic exercise could improve the quality of well-being among Seventh-day Adventists who engage in aerobic recreation.

The procedure for its implementation was as follows:

1. A presentation to the elders of the Dora Creek Church outlining the need for a series of seminar programmes motivating people to improve their physical well-being

2. The operation of an audio-visual programme in the Dora Creek Church on wholistic health highlighting the relationship of aerobic fitness to general well-being

3. A recruiting of volunteers who would participate in a programme of aerobic recreation[1]

4. An evaluation of the programme through questionnaires measuring possible improvement during a four-month period

5. The gathering of selected case histories from participants

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[1] To volunteer for such a programme certain qualifications needed to be met. These person should be:

a. Members of the Seventh-day Adventist Church

b. Committed Christians

c. Not regularly involved in aerobic recreation prior to the programme

d. Participants in a seminar programme highlighting the place of aerobic recreation in the philosophy of wholistic health, or required to accept personal counsel and be subject to discussion, encouragement and scrutiny by the project author

e. Willing to file two confidential reports on themselves involving general questions on aspects of their lifestyles

f. Open to setting personal goals to be reached over successive periods of time as an encouragement to improve their physical well-being

6. The computing of statistics gained through the questionnaires

7. The presentation of results and conclusions, with suggested improvements for future programmes of this nature

Method

Promoting the health project had to be restricted.[1] The first meeting commenced at an early morning elders' conference at the Dora Creek Church in late May, 1981. The proposed outline of the Seminar Programme was respectfully accepted. It was noted with some concern that the majority of men in attendance were retired or semi-retired--being in their late sixties.[2] While this in itself was not a difficulty, and indeed most of these men turned out in force at the later programmes, they were generally too old to be able to fully embrace the type of recreation advocated.[3]

The meeting agreed that the programme should operate for six weeks in a seminar style using 35 mm colour slides as a

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[1] Having arrived at Dora Creek in early April, ground work and confidences needed to be developed quickly. This was found to be almost impossible in the short time before the project was to commence. It was necessary, therefore, to seek other participants outside the Dora Creek membership.

[2] Other obstacles in preparing this series included: The change of Church offices in the middle of the year, (June 30), just as the programme was commencing. This hindered co-ordination as the new officers in the Health and Temperance department were not known until near the end of June. In this case, the person elected was very old and tired of being in office.

[3] There was a high percentage of retired elderly people. They agreed in principle with the programme, but could not be involved.

stimulus for discussion. Each of the six sessions to be presented between 7:00 and 8:00 P.M. every Wednesday were designed as building blocks to motivate people toward improving cardiovascular and pulmonary fitness. A significant feature would be the testimonial of an Adventist who had experienced a total physical transformation from poor physical health to a high energy fitness level.

The programme was divided into six sections.[1]

1. General introduction to wholistic health
2. Relationships between mental and physical health
3. Will-power and physical fitness
4. The effects of aerobic exercise
5. An adequate diet and the control of obesity testimonial session
6. Assessment and review of goals on wholistic health with volunteers being asked to fill in a lifestyle questionnaire

The Aerobic Exercise Programme

This section of the project was left largely to individual preferences within certain definitions or boundaries. These definitions were offered as the keys to satisfaction and fulfilment for aerobic recreation. Participants were encouraged to seek enjoyment and relaxation and to find challenge and purpose

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[1] See Appendix 19 for a detailed presentation of the six meetings. Approximate average weekly attendance at church during 1981: 150 persons involving 34 families. There were 87 adults (21 and over), and 63 youth under 21. Thirty persons were over 65 years of age. Thirty-eight were between 16-50. There were twenty youth between 16-21. Twenty-eight married couples were under 50.

in their choices. A systematic programme in a social setting (i.e. with other people) was preferred and each person was encouraged to set various short-term goals for himself which would not be discouraging or endanger his health.

In their selection of the type of aerobic activity, younger participants were able to choose more vigorous activities involving higher energy expenditure. These included basketball, squash, and jogging.[1] Older persons (i.e. those over 30), including those who were obviously overweight and who had an impaired fitness level, were advised to commence their aerobics with brisk walking. As their strength increased, more energetic forms could be selected. Reading was provided giving useful advice on the various procedures and pitfalls of aerobic exercise.

Occasional informal meetings took place often over a meal or at the place of work. These occurred as need arose, and encouragement and advice was offered to improve the quality of the participant's programme. As a further stimulus, the writer shared in the participant's recreation when possible. At the end of each four months' programme, surveys[2] were again sent out to be filled in and returned. The results were then calculated.

The Community Lifestyle Survey

This survey was developed in order to measure what was considered to be a person's general well-being, the four

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[1] See Appendix 17a and 17b (for participants' personal aerobics programmes.

[2] These surveys were identical with the first forms.

interrelated areas of a person, the mental, spiritual, social, and physical.[1]

The object of the survey was an attempt to determine the change in a person's coping and relating abilities after a period of approximately four months of aerobic recreation.[2] The subjects were acquainted with six factors that would aid an aerobic recreation programme. These factors were that exercise should be:

1. Enjoyable
2. Relaxing
3. Systematic
4. Aerobic
5. Intrapersonally goal-setting
6. Socially oriented

Experience would seem to demonstrate that if one or more of these factors was absent for any length of time the quality of recreation was likely to depreciate.

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[1] See Appendix 20 for a copy of this survey. The numbers in the boxes indicate the values assigned to each answer, many of which are based on experimental findings, e.g. quantity of sleep, estimated energy expended in exercise, et cetera.

[2] See Appendix 21 for a philosophy of the rationale based on scientific findings. The philosophy behind these functions was derived from research in areas which are now generally recognised as having a scientific base. Each of these areas involved a choice that could either lead to, or detract from a person's physical and mental well-being, and quality of health. From this it might be reasonably supposed that the quality of relationships with others would improve and that one's coping abilities might become more positive in orientation.

A Scientific Base

The scientific base for the survey was developed from such studies as the Sydney Medicheck samples by Reynolds and Rizzo[1] and the Cheraskin and Ringsdorf reports.[2] They examined such recognised problems as headaches, poor sleep, drug use, depression and emotional difficulties, relationships with others, weight, dietary habits and physical fitness. These all had a relationship to physical well-being or susceptibility to disease. For instance, obesity was correlated with diabetes and high cholesterol and blood pressure were considered significant factors in the cause of cancer.[3]

There was a relationship between mortality and hours of sleep per day. The optimal sleep time was seen to be approximately seven hours.[4] These persons had the lowest death rates. Others who had more or less sleep had, on average, a progressively higher death rate (i.e. death occurred at a younger age).

Severe prolonged stress is known to deplete energy reserves and contribute to physical and mental breakdown. Depression, a factor linked with stress in this survey, is almost always associated with distress either as a cause or effect--

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[1] Ingrid Reynolds and Cowcetta Rizzo, Psychological Problems and Sydney Adults, (Sydney: Adept Printing Pty. Ltd., 1979). See Appendix 21.

[2] E. Cheraskin and W. M. Ringsdorf, Predictive Medicine (Mountain View, California: Pacific Press, 1973). See Appendix 21.

[3] See figs. 1, 2, in Appendix 21.

[4] See figs. 3 in Appendix 21.

especially when the causes of this distress are permanent or can not be easily removed. Medicheck results indicated that 33% of women and 15% of men surveyed had significant depression related to their physical health.

The Medicheck samples revealed that on an average "almost one female in ten and one male in twenty, reported that they suffered from headaches 'almost daily'."[1] Headaches from tension were by far the most prevalent and constant.[2] The Medicheck survey stated:

> Both male and female sufferers had a much higher prevalence on almost all other psychosocial problems. Daily headaches were particularly closely related to stress, sleeping problems and depression. Almost half of the males and three quarters of the females suffering from daily headaches had four or more other psychosocial problems. The data indicated that these headaches tended to be more frequently concomitants of emotional stress than physical in origin.[3]

In dietary habits there was a significant relationship between nutrition and health. Much information has been published in the last twenty years to indicate that dietary habits affect well-being physically and mentally.

Another significant factor noted in the survey was that:

> The person ingesting significant amounts of highly processed carbohydrate foods (including 'sweets') receives only a

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[1] Reynolds and Rizzo, p. 13. The prevalence of headaches did not seem to vary with age, occupational status, suburb area or status. There appeared to be no significant difference between housewives and working females. Married men would seem to have the lowest prevalence of daily headaches.

[2] When asked "What sort of changes in your life and/or treatment would relieve you of your headaches?"--"I really don't know," or "I wish I knew," was the most frequent response. (Reynolds and Rizzo, p. 13).

[3] Ibid. (Emphasis supplied)

limited quantity of the most essential nutrients from such foods. In addition, he has less appetite for more nourishing foods.[1]

Physical Activity and Well-Being

It has been observed that people who are engaged in exercise programmes are less likely to use stimulant foods such as tea, coffee and alcohol.[2] Cheraskin and Ringsdorf demonstrate the relationship between clinical symptoms and signs which include "parallelisms between exercise and variables such as tea, coffee, alcohol consumption, tobacco consumption and vitamin supplementation."[3] Proper diet and exercise, it is claimed, can slow down the aging process.[4] Physical exercise is said to be a significant factor in causing people to "be made younger at heart."[5]

The Lifestyle Questionnaire was constructed as an introductory pilot measurement, on the basis that physical activity affects various aspects of body function. It was designed to determine the relationship between quantity and quality of aerobic exercise, and the ten variable factors thought to be associated with well-being.[6]

Survey Results

This survey was investigated from an Adventist viewpoint, and for this reason, may not necessarily be compatible with the viewpoints of members of the general public. Many

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[1] Cheraskin and Ringsdorf, p. 98. [2] Ibid., p. 106.

[3] Ibid., p. 101. [4] Ibid., p. 162. [5] Ibid., p. 163.

[6] See Survey Results, p. 77.

non-Christians or non-Adventists may not regard regularity in church attendance or other organised church functions as bearing any significance in desirable relationships to each other or to God. However, the quantity of sleep, and optimum weight have strong scientific correlations to physical well-being.

The survey has produced data which shows correlations between exercise, diet, sleep and church relationships.[1] It also appears to demonstrate some significant effects of aerobic recreation on other factors relating to physical and psychological well-being among Adventists. An increase in the number of participants would have also given more validity to the results.[2]

The survey was divided into ten variable factors.[3] They are as follows:

1. Weight (Questions 2, 3, 4, 5, 48)
2. Church relationships and Spiritual awareness (Questions 7, 8,9, 10, 11, 12)
3. Sleep Patterns (Questions 13, 14, 15, 16, 18)
4. Dietary Habits (Questions 19, 20, 21, 22, 23, 24)
5. Work Pressure (Questions 25, 26)
6. Headaches (Question 27)
7. Emotional Well-being (Questions 31, 32, 33, 34)

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[1]The results from this questionnaire were processed using the B.M.D.P. (Biomedical Computer Programmes) series of statistics programmes developed by the Department of Biomathematics, University of California, Los Angeles, revised in June 1981.

[2]Twenty participants were involved in this project.

[3]See Appendix 20.

8. Community Outreach and Communication (Questions 35, 36)

9. Aerobic Recreation (Questions 38, 39, 40)

10. Quality of Recreation (Questions 40, 41, 42, 43, 44, 45, 46, 47)

Scaling the Survey Questions

The survey was weighted using a scale of one to nine.[1] The higher the score the more desirable the expression of well-being. Some sections involved more questions than others.[2] This was partly due to the availability of scientific information which aided in measuring well-being and general health.

Outline

The results of the Community Lifestyle Questionnaire are set out in three sections. They are a description of:

a. The population surveyed

b. The relationship between selected factor variables (e.g. weight and diet, aerobic exercise and sleep, etc)[3]

c. The effects of this programme on factor variables and selected individual components, i.e. answers to specific survey questions

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[1]The scale was chosen on the basis that if two adjacent squares were ticked an intermediate value could be assigned (A scale of 1-5 would have caused some arbitary judgments.)

[2]See Appendix 20. The areas more closely examined were factors 2, 3, 4, 7, 8, 9, and 10. Questions not correlated included 6, 17, 28, 29, 30, and 50.

[3]These statistics did not measure the effects of this project's programme on participants.

a. Description of the Population

The survey group ranged from 16 to 44 years with an average age of 28. The heights varied from the tallest being 188 cm to the shortest, 157 cm. The average height was 172 cm. Body weight ranged from 45 kg to 85 kg, the overall average being 68 kg.[1] The ideal weight, determined from a height and frame size table,[2] ranged from 12% underweight to 27% overweight with an overall average calculated from the combination of both survey results at 6% overweight.

The percentage of the participants' lives spent as a Seventh-day Adventist varied from zero to 100.[3]

b. Relationships between Factor Variables in Participants

The data established from the combination of both surveys revealed five significant relationships between the factor variables.[4] These are as follows:

1. There was a high correlation[5] between the quality

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[1] See Appendix 22.

[2] See Appendix 23 for a height, weight and frame size scale.

[3] Persons born of Adventist parents often consider themselves Adventists from birth.

[4] See Appendix 24. These statistics do not measure changes in variables that occurred before and during exercise programmes.

[5] The 'p' factor listed indicates that the chances of the statistic being an error are greater than one in one thousand, i.e. $p<.001$ = more than one in one thousand
$p<.01$ = more than one in one hundred
$p<.1$ = more than one in ten

of exercise of exercise done and the participants' relationship to the church ($p<.01$).

2. There was also a significant relationship between good dietary habits and exercise ($p<.001$).

3. As expected, participants who had poorer dietary habits tended to be more overweight; i.e. the better the diet[1] the greater the likelihood of optimum weight ($p<.001$).

4. People with better emotional stability appeared to enjoy their work more, ($p<.001$) and to cope better and to relate better to other people.

5. People who spent more hours in aerobic exercise appeared generally to be more involved with the community ($p<.01$).

c. The Effects of Aerobic Exercise on Factor Variables

Generally speaking, this aspect of the survey showed some direction toward better well-being in all factors.[2] Statistically, however, most of these differences between variables were not significant enough to be certain that aerobic exercise had been responsible for such changes. The main area in which some improvement appeared to take place was in the perceived effects of aerobic exercise.

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[1] For the purpose of this survey good dietary habits included: (1) not eating between meals; (2) endeavouring to make breakfast (or the first meal after waking) the main meal; (3) avoiding the habitual use of sweets and other empty calorie foods; (4) avoiding the use of meat.

[2] See Appendix 25.

Perceived Effects of Aerobic Exercise

This factor, involving seven questions, was the most comprehensive section of the survey. The participants perceived the overall effects to be positive and mostly very significant. Selected case histories of participants gave further evidence for this view.

Enjoyment (Q.40) showed a marginal increase in relation to the increase in the quantity and quality of aerobic exercise. None of the participants who improved their aerobic quality enjoyed their recreation less, most of them often finding more satisfaction.

Deep breathing and sweating (Q.41) also showed a dramatic increase ($p<001$). The energy expended during the program appeared to double in most instances although the hours spent in actual leisure time increased only marginally. There was, however, a significant increase in the quantity of aerobic exercise ($p<001$). The average time spent in exercise during leisure hours before the first survey (25%) increased to over 50% at the end of the four months' programme ($p<.01$).

The time spent in actual aerobic exercise (Q.39) increasing from a mean 2.7 to 5.3, ($p<01$) with estimated[1] energy output (Q.49) doubling ($p<001$).

Self confidence (Q.42) was also perceived to have increased significantly ($p<005$). This would seem to indicate that there was more energy within the person to approach tasks

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[1] See Appendices 16, 17, 18.

and to feel secure in applying himself to those tasks. Questions involving the improvement of relationships with others (Q.43), improved physical well-being (Q.44), and ability to approach life's challenges showed a slight increase. In reply to aerobic exercises' effect on general health (Q.46) and character development (Q.47), the trend towards improvement was quite significant ($p<.01$).

Most participants experienced a change toward their optimum weight. The average of 8% overweight for the group before exercise was reduced to 5% overweight after the programme ($p<.01$). A minority group consisting of several underweight participants experienced little change.[1]

Other Effects of Aerobic Exercise

During the programme there was no significant statistical change in church relationships and spiritual awareness. There was no significant relationship between improvement of aerobic fitness and improvement of church relationships or spiritual awareness, although this may have occurred marginally in some individuals. The measuring of such an improvement in this survey may have been too subjective.

Sleep patterns appeared to improve ($p<.05$), as did dietary habits during exercise ($p<.05$). There were no observable changes in work or emotional patterns probably because the instrument measuring these factors should have been more

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[1] Persons who are slightly underweight are considered to be at less risk in dying prematurely.

rigorous. A high percentage (in comparison to the average community) were not suffering from headaches of any consequence at the commencement of the programme. Furthermore, they did not admit to being often depressed or unable tc cope with that depression.[1]

Finally, the community relationship factor did not improve significantly. A reason for this may be that, apart from only one question being asked, a high percentage of people living in this area were members of the Seventh-day Adventist church. This aspect may tend to cause people to be insular or to feel somewhat remote to the events of the world outside.

Testimonies of Selected Participants

Case History 1

Husband (44)

> I have noticed two basic improvements to myself since commencing the aerobic programme. The first is to my peace of mind. I know that, as a physical being, my body needs regular exercise in order to perform well consistently, and when I don't exercise, the knowledge that I am failing in this regard decreases my self-respect, and that has a dampening effect on my total performance. Since commencing the aerobics programme I am not only feeling better physically, but both my inlook and outlook have improved. Secondly, I find that when my health is good, my emotions are much more stable and controllable. Some people might see this last aspect as an improvement in my spirituality. I see it as a direct result of an improvement in general health due to the aerobics programme. (Perhaps I am making a false dichotomy between what is spiritual and what is good and right.)

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[1] See Reynolds and Rizzo, pp. 14-16 and comments made by Webster and Rawson, pp. 419-20.

The aerobics programme has had an even more remarkable effect for good on my wife. She has had high blood pressure for the last decade, and for the last six years she has been taking up to 6 tablets daily (2 morning, 2 night) to keep it under control. Since commencing the aerobics programme she has been able to reduce her tablets (under doctor's supervision) from 6 daily to an average of 1½ daily. This factor alone has had a tremendous effect for good on her mental health and general outlook on life. As a person she is much happier, and is now a keen, unflagging advocate of regular exercise.

Wife (41)

The greatest benefit for me in my aerobics programme is the feeling of well-being I have. My very busy programme of homemaker plus secretary (20 hours per week) makes for a full-time load. On top of this I have some involvement with Church work and community work which would tax me to the point of stress if I did not make time for a daily aerobics programme. I have also had to control a blood-pressure problem caused by the stress of a demanding programme in Papua New Guinea. This has improved rapidly under a regime of regular exercise. Medication, although still necessary due to my busy programme, is now one diuretic tablet daily and one blood pressure tablet every second day. Whereas once it was two diuretics and 4 b.p. tablets daily at the critical stage. Aerobics programme also assists in weight control.

My observation of the aerobics programme on my husband is a more relaxed attitude. Lack of exercise makes him up-tight. Exercising together also makes for a closer communication bond which is of great value to a happy marriage.

Case History 2

Woman (32)

It was not until I was approached by the author of this project that I felt encouraged and challenged to improve my physical fitness. My husband had often suggested that I get some exercise but I needed a push from outside. Physically, I was not a strongly built person and this, apart from other factors, tended to make me hesitant in accepting challenges and attacking problems in a positive manner.

As if by coincidence, when I decided to make the break I met another woman who was a little older, who regularly jogged. The combination of the interest taken in my physical

well-being and the prospect of jog-walking with another person helped me get started. It wasn't very easy because I had to find time in my programme which included looking after my young son.

Earlier I had tried hundreds of dollars of vitamin tablets in order to feel better--to my husband's disgust. Then I read Adele Davis' book on health and thought that was very good advice. But somehow it didn't really fulfil my body's needs.

While feeding my baby, breast feeding was very important but sometimes I had difficulty supplying enough milk, coupled with this I had to contend with difficulties associated with premenstrual change. When I starting jogging and brisk walking the premenstrual problems began to alleviate.

For the first week I got out of breath embarrassingly quickly. My lungs hurt and the cold air didn't help. But over the first few weeks my breathing came easier and my legs began to feel as if something was really happening to them. The girl who was running with me became a good friend. She would call regularly and kept me on my toes so to speak, in keeping my appointment. Her company, while exercising, helped remove pain and boredom.

After six weeks I was beginning to feel terrific. Elation would take control and I attempted greater exploits running around a block about 1 kilometer long, twice, and then brisk walking the last round. Then it happened. I began to feel sore and tired in the stomach. It almost felt as if I was being cut apart by my IUD. I went to the doctor for his advice on the severe cramping pain in my lower abdomen. He suggested I stop jogging. I don't know what the problem really was but it upset me to think that just as I was beginning to enjoy a new-found benefit, I had to stop. I then went on holidays for a fortnight and my fitness slipped back quickly.

Since being back and with more than three months having elapsed since I started, I have again started a brisk walking programme. I find that despite the time off, I am a lot quicker and can feel a spring in my step, which gives me a certain satisfaction. I intend to get fit but I think I will take it a little slower this time as it seems I may have been too eager the first time.

I have realised that a correct diet, while important, certainly does not answer adequately my physical or psychological needs. My aerobic exercise programme has helped relieve an allergy problem I was suffering. It has given me a more positive attitude to my teaching. I am definitely more organised in my approach from the gain of extra energy.

> Perhaps an unexpected change has been my increased concern for comfort and physical well-being of my feet and limbs. Instead of walking about in fashionable high leg-boots, I now choose a comfortable walking or jogging shoe whenever possible, thus reducing sore legs and blistered feet.

Husband comments

> This aerobic programme that my wife has at last engaged in is a marvellous idea, especially when you're not handling life very well. I have noted some really positive changes in her. Basically she is happier in herself. From being very discouraged at times, she is becoming quite a different person with this activity.

Summary

This chapter describes the implementation of a project designed to improve the physical and psychological well-being of Seventh-day Adventist Church members. A seminar presented the problems of poor physical fitness and attempted to motivate people to recreative aerobic exercise programmes. The effects of these programmes were measured by a Lifetsyle Questionnaire and described in selected case histories. The results confirmed, to some extent, the writers' objective to initiate a transformation in people's physical and mental vitality. With a description of the project implementation completed, chapter five now reviews the strengths and weaknesses of this project and offers suggestions for improvement.

CHAPTER V

TOWARD A FUTURE MODEL

A Review: The Impact of this Project

This project has endeavoured to relate how the Word of God revealed man's sacred privilege to care for his body. Modern scientific discovery and supporting views of Ellen White on exercise have aided our understanding of the problems and solutions to physical well-being, and its relationship to psychological well-being.

The writer believes that this project revealed trends suggesting that aerobic recreative programmes were helpful to most participants in renewing their physical and mental being.[1]

The perceived psychological effects and the selected case histories demonstrated some significant and, sometimes, dramatic improvements in well-being. Tangible benefits were experienced and valuable insights gained through seeing the advantages of higher energy levels. A sense of caring and openness appeared to develop among some participants and to enhance their quality of fellowship. Despite some sore limbs and shins, and at least one visit to a doctor, almost all who took part

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[1] It is accepted that not all the factors which may have contributed to change in the participants were necessarily influenced by this programme.

in this project were convinced of the need to improve and maintain their aerobic fitness levels.

Project Strengths and Limitations

Personnel

The difficulties associated with this project's operation included some limitations. Because projects of this nature deal only with human beings who are willing participants, achieving a sample of satisfactory size was problematic (Man is not a laboratory animal who can be manipulated to suit ideal conditions). The use of a control group would have afforded greater validity to the significance of the results.

Lifestyle Questionnaire

The scaling and weighting of this type of survey involved both subjective and objective measurement.[1]

Subjective measurement occurred in answering questions relating to perceived feelings, e.g., the quality of aerobic exercise. An example of objectivity was illustrated in optimum and actual weight comparisons. One had to be careful to avoid drawing conclusions from apparently small, but positive, statistical changes. In spite of the above limitations, the writer is satisfied that positive changes did occur among many of the participants, in both mental stimulation and physical vitality.

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[1] It is recognized that a difference exists between scientists of clinical orientation and psychologists with regard to the validity of self reports.

In proposing a future model, several significant elements were drawn on. These included information relating to theological, scientific and sociological areas, complemented by personal experience within the past five years.[1] This model is outlined in the next section.

Proposal for a Future Model

A future model for an aerobic recreation programme should incorporate many of the components already used in this project, and include a number of added factors to enhance any future programme. This new model is viewed in two sections--each being an indispensible complement to the other.

1. The first section relates to a Propositional model. This should be responsible for the presentation of biblical and scientific data to the individual mind through seminar or personal instruction.

2. The second section involves a Relational model. This should consist of practical sessions involving the churched and un-churched in the community. Its purpose would be to initiate experiences through outdoor physical activity and to generate improved physical and psychological well-being. From this, it could be anticipated that any social and religious prejudices might be decreased or dissolved.

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[1]The propositional model developed in this project at Avondale College was used in an earlier form for a community model that was implemented at Innisfail, North Queensland, in 1977-78. Out of the latter programme a good deal of community interest developed. Radio commentaries each day during prime time, and a newspaper column (circulation 20,000) were operated. This programme aided in the transformation of an alcoholic person (now a church elder), his wife (formerly a heavy smoker), and a young nightclub 'bouncer'

The Propositional Model

A series of six seminar meetings should be conducted to explain and motivate people towards more aerobic-oriented recreative experiences. The problems of impaired health and fitness should be presented through audio-visual illustrations by specialist speakers. These meetings, each of two hours duration, would include an hour of theory and an hour of demonstration. This could involve illustrations of the practice, procedures and problems associated with the commencement and maintenance of an aerobics programme.[1] Further motivation should be obtained by bona fide experiences or testimonies from persons who have been transformed by lifestyle changes involving aerobics.

A more rigorous survey could be developed and sharpened. Clinical measurement, e.g., blood pressure, resting pulse rate, a fitness step test, lung capacity, triglyceride and cholesterol tests, would add significant validity to the survey's objective measurement.

Personality tests, while not essential, might also be included. These would be used under specialist supervision. Medical and psychological testing mechanisms could possibly add further incentive and authority to the programme and validity to the final results.

(described in Appendix 7) who is now a missionary high school teacher.

[1]There are many authorities on this subject. Among the recommended books are those by Dr. Kenneth Cooper, e.g., The New Aerobics (New York: Bantam Books, 1970), and Dr. G. Sheehan, e.g., Dr. Sheehan and Running (Mountain View, California: World Publications, 1975).

The Relational Model

The original project could be greatly strengthened in this section, e.g., formal outdoor exercise programmes for participants. Past experience demonstrated to the writer that this was a very significant factor when developing social participation and a sense of closer community. Locations such as an unpopulated hard sand beach, or a relatively private and grassy park make excellent venues. The best meeting time has been found to be early on Sunday mornings around 7.00--7.30 A.M.[1]

The presence of a doctor or physical instructor adds security and authority to these meetings. At the first Sunday morning session an individual's performance capability, personal goals and desires should be ascertained. Handicaps may be placed on better achievers in group activities in order to finish together with those less fit and provide challenge for those who seek it. Good quality jogging or exercise apparel including supportive and comfortable footwear other than day shoes or sandshoes should be worn. The group should also be encouraged to develop an exercise programme at least three times a week apart from the Sunday morning group. At the end of each Sunday session, after final advice and discussion, prayer could be offered; this being in the form of a thanksgiving benediction.[2]

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[1] In a series of practical sessions developed at Innisfail (population 10,000), beach meetings at 7.00 A.M. on Sunday mornings proved very popular. The beach was quite private being 16 km from the town centre.

[2] The community model as outlined was tested in Innisfail and is highly recommended in any future outreach to the general public, especially where similar conditions exist.

As at the commencement of the seminar programme, another series of personality and medical check-ups would prove helpful. The Community Lifestyle Survey would then be filled in a second time and the compared results processed.

Further observations in successfully implementing future programmes should include the involvement of medical or para-medical personnel or specialist ministers who already reside in the community. Adventist ministers in particular have an ideal opportunity to be seen to be more practical, realistic and in control of life when ministering and serving the churched and un-churched. It is a well-known fact that leaders in ecclesiastical and civic arenas have a considerable impact on the community they serve. They would greatly benefit their community by becoming apostles of body maintenance, drawing people's attention to the need of respecting the physical health and maintenance of their bodies.

Good health concerns all of us. If a clergyman's job is to uplift people and guide them to be in touch with God as they know Him or to be a part of God's work, then the development of that person in all his aspects is a logical goal. He at least has the privilege and duty of being a positive example of a healthy lifestyle and of encouraging others to build a better body temple.

In retrospect, Jacques May has graphically summarized man's capacity to withstand external bombardment by saying:

> ... Some people are made of glass and shatter under the slightest environmental challenge. These are the people with a high degreee of host susceptibility and poor resistance. Others appear to be structured of celluloid and only scar. Some few are structured of steel and tolerate well the outer

world. These are those with good host resistance and a low host susceptibility.[1]

Reviewing this philosophy in the light of this project one may say that persons with bodies of more effective endurance are better equipped to respond positively to threatening situations, at least of a temporal nature. While it may remain difficult to prove, the writer suspects that to some extent at least these persons may also have a better coping base in which to handle matters relating to eternity.

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[1]J. M. May, "The Ecology of Human Disease," Annual: New York Academy of Science 84 (8 December 1960): 789-94.

APPENDIX 1

ASPECTS OF THE SDA CHURCH THAT APPEAL MOST TO PEOPLE

(in Percentages)

	Men	Women
True Doctrines	78	59
Emphasis on Christ	40	54
Emphasis on Health	20	54
Friendliness	32	38
Spirit of Prophecy	17	20
Missionary Zeal	17	19
Church Services	6	18
Christian Education	15	7
Other	6	3

CHANGES IN PERSONS' LIVES AS A RESULT OF SDA CHURCH MEMBERSHIP

(in Percentages)

I have come closer to God	73
I received a broader understanding of Scripture	65
I have become a better person	42
I have become happier	35
I have become healthier	18
My social life has changed	12
My economic status has improved	7
No changes in particular	10

From these three examples in table form, one may discern that a considerable majority of persons who were influenced to become Seventh-day Adventists came through neighbours, relatives, acquaintances, or friends. Conservatively, at least 57% of Seventh-day Adventists from this survey decided as a result of friends.

Extract from:

Gottfried Oosterwal, Patterns of S.D.A. Church Growth in North America (Berrien Springs, Michigan: Andrews University Press, 1976), pp. 36-39.

APPENDIX 2

PERSONS AND AGENCIES THAT INFLUENCED PEOPLE TO JOIN THE SDA CHURCH

(in Percentages)

		Men	Women
1.	Relatives	30-35	60-65
2.	Neighbours, Friends, Etc.	55-70	20-30
3.	SDA Schools	28-34	25-30
4.	SDA Ministers	10-14	25-30
5.	Public Evangelism	6-9	13-16
6.	Radio, TV	2-4	6-9
7.	Bible Correspondence	1-2	3-4
8.	SDA Publications	1-2	3-5
9.	Other	4-5	1-2

PERSONS AND AGENCIES BY WHICH NON-SDA'S FIRST BECAME ACQUAINTED WITH THE SDA CHURCH

(in Percentages)

Neighbours, Friends, Etc.	43
Relatives	24
SDA Publications	13
Radio and TV Programs	4
SDA Community Services (medical, social and other institutions)	4
SDA Ministers	3
Public Evangelism	2-3
Other	7-8

According to these statistics, Adventism's "Emphasis on Health" accounted for at least 20% of the male adherents and a high 54% for the female church members. It would have been useful to have determined the underlying meaning of the remark: "I have become a better person," of which a significant 42% answered positively, along with 35% feeling "happier" and 18% feeling "healthier."

Extract from:

Gottfried Oosterwal, Patterns of S.D.A. Church Growth in North America (Berrien Springs, Michigan: Andrews University Press, 1976), pp. 37-39.

AGENCIES THAT HELP THE BELIEVERS MOST IN THEIR SPIRITUAL GROWTH

Agency	20-40 Years of Age	Over 40 Years of Age	Male	Female
Sabbath School	42%	32%	56%	50%
Church Service	42	50	44	54
Association with SDA Friends	58	48	56	42
Bible Study	36	39	37	40
Prayer-Meditation	26	30	27	38
Spirit of Prophecy Books	18	29	25	31
Review and Herald	16	19	17	20
Prayer Meetings	7	10	6	12
Other SDA Publications	12	9	11	8
SDA Ministers	4	5	3	6
SDA Radio and Television	2	4	3	5
MV Meetings	2	3	3	3
Mission Activities (Lay Activities)	4	2	2	2
SDA Community Service	4	-	-	-
Other	4	2	1	3

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APPENDIX 3

15 LEADING CAUSES OF DEATH IN THE UNITED STATES FOR 1900 AND 1965

	Cause of death 1900	Death rate per 100,000 of population of all ages		Cause of death 1965	Death rate per 100,000 of population of all ages
1.	Tuberculosis	194.4	1.	Diseases of the heart	367.2
2.	Pneumonia	175.4	2.	Cancer	153.5
3.	Diarrhea and enteritis	139.9	3.	Stroke	103.7
4.	Diseases of the heart	137.4	4.	Accidents	55.7
5.	Nephritis	88.7	5.	Influenza and pneumonia	31.9
6.	Disease of infancy	72.3	6.	Diseases of infancy	28.6
7.	Stroke	72.0	7.	Arteriosclerosis	19.7
8.	Accidents	66.6	8.	Diabetes Mellitus	17.9
9.	Cancer	64.0	9.	Cirrhosis of the liver	12.8
10.	Bronchitis	45.3	10.	Suicide	11.1
11.	Meningitis	40.6	11.	Congenital Malformations	10.1
12.	Diphtheria	40.3	12.	Emphysema	9.6
13.	Typhoid fever	31.3	13.	Nephritis	6.2
14.	Influenza	26.7	14.	Hypertension	6.0
15.	Paralysis	26.2	15.	Homicide	5.5

Extract from:

H. S. Diehl, and W. Dalrymple, Healthful Living (New York: McGraw-Hill Book Co. Inc., 1968), p. 10.

APPENDIX 4

In this society, where the opportunity to satisfy pleasure and to obtain material comforts is unprecedented, the statistics on crime, mental disease, alcoholism, venereal disease, gambling, dissatisfaction with work, drug abuse, and general discontent keep steadily worsening. The rates of these indices of alienation are increasing more sharply in the affluent suburbs. It is not the bottling up of instinctual needs that is responsible for this trend, nor the lack of external rewards. Its cause appears to be the dearth of experiences which prove that one is competent, in a system that is geared for the efficient transformation of physical energy. The lack of intrinsic rewards is like an undiscovered virus we carry in our bodies; it maims slowly but surely.

Anyone who stops to watch children at play will see how intrinsically rewarding action can be. What children do is "play" only by the conventional wisdom of adult perspective. One could say just as well that what they do is work. But both labels are confusing: what children do most of the time is interact with the environment on a level at which their skills match opportunities. Left to themselves, children seek out flow with the inevitability of a natural law. They act without interruption if they can use their bodies, their hands, or their brain to produce feedback which proves that they can control the environment. They stop only when the challenges are exhausted, or when their skills are.

Extract from:

Mihaly Csikszentmihalyi, Beyond Boredom and Anxiety (San Fransisco: Jossey-Bass, 1977), p. 199.

APPENDIX 5

WELL-BEING: POSITIVE AND NEGATIVE EFFECT

Traditional psychology has shown a concern "mainly--with behaviour and performance, rather than the reality of inner states of experience' (Csikszentmihalyi, p. 5).

In the past, the definition of happiness or well-being as it has become known, has been tied to either ethical, theological, political, or economic considerations (Bradburn, p. 7).

More recently well-being has been viewed as a psychological determinant. Bradburn views psychological well-being within the positive and negative effect frames of reference. This can be likened to the older "pleasure--pain or utility models, that view an individual's happiness or well-being in which pleasure predominates over pain in this life's experiences" (Bradburn, p. 9).

Negative effect involved such feelings as boredom or loneliness from being remote from people, to positive effect such as being excited or interested in something, or being "on top of the world." These two dimensions were independent of each other, with the overall discrepancy between positive and negative effect giving a relative measure of well-being and hence overall happiness. Of childhood environment, Bradburn observes:

> The larger the number of cues associated with negative effect that a child learns, the more likely it is that in his adult environment he will frequently encounter situations that will trigger negative effect. Over time, this greater frequency will lead to a situation in which the individual experiences high levels of negative effect for fairly prolonged periods of time (Bradburn, p. 122).

It has also been shown that to some extent mental happiness, (see Chapter 4) education, (p. 95) and income (p. 91), probably have some bearing on well-being when overall positive-negative effect answers are examined (p. 105). These areas are not accounted for in this project.

Extracts from:

Mihaly Csikszentmihalyi, Beyond Boredom and Anxiety (San Fransisco: Jossey-Bass, 1977).

Norman Bradburn, The Structure of Psychological Well-being (Chicago, Illinois: Aldine Publishing Company, 1969).

APPENDIX 6

CSIKSZENTMIHALYI'S CONCEPT OF "FLOW"

According to Csikszentmihalyi, flow is dependent on two main partners--one related to task difficulty, the other to the comeptence of the performer. This is summarised in Fig. 1.

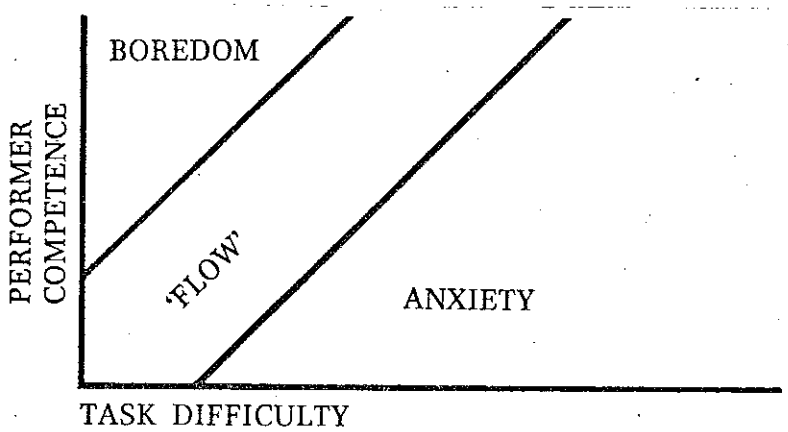


Fig. 1. (Eggers, The Sport Drug, p. 25)

In a situation where the difficulty of the task exceeds the competence of the person carrying out that task, a situation of anxiety arises. For example, a moderately competent mountain climber faced with a grade A slope is unlikely to settle comfortably into a 'flow' pattern, but is more likely to be aware of the dange and anxiety in the situation.

On the other hand, a highly competent performer faced with any easy task is likely to become bored. A grade A climber on a grade C slope has less stimulation than necessary to require full concentration and is therefore mentally unoccupied as well as physically unconcerned. (Eggers, The Sport Drug, p. 25.)

The essential elements to the "flow" experience according to Csikszentmihalyi, are chiefly found in:

(1) "The merging of action and awareness" (Csikszentmihalyi, p. 38). Undivided attention is given to it, whereas reality from outside interrupts the flow.

(2) "The centering of attention on a limited stimulus field." (p. 40.) Motivational elements draw the player into play with his intent on being competitive.

There are dangers in both these elements in that both time and purpose can be neglected and hence in the Christian context at least we cease to be good stewards of our time or energy. It is in this area that indulgence can supplant the more positive objectives and expressions of the true self within the Christian understanding.

(3) "Self-forgetfulness," loss of ego," "transcendence of individuality," or "loss of self-consciousness," may all describe the third element of flow. This does not mean the loss of one's own physical reality.

(4) "The participant" is in control of his actions and of the environment. (p. 44.) He is not worried about the possibility of loss of control.

(5) These flow experiences "occur in activities where one can cope, at least theoretically with all the demands for action." (p. 45.)

(6) Another usually inherent ingredient of flow is that "it contains, non-contradictory demands for action and provides clear unambiguous feed-back to a person's actions." (p. 46.)

(7) A final characteristic of flow is seen in its autotelic nature. "It needs no goals or rewards external to itself." (p. 47.)

It is in this area that we must differ with the definition of recreation for while this experience of flow may be legitimate,

there also needs to be an extrinsic purpose, goal, and design for its activity when seen in the Christian context. Never-the-less the chief motive for the action must never be the hope of some hurtfully oriented reward.

Extracts from:

Mihaly Csikszentmihalyi, Beyond Boredom and Anxiety (San Fransisco: Jossey-Bass Publishers, 1977).

Gary Eggers, The Sport Drug. (Sydney: George Allen and Unwin, 1981).

APPENDIX 7

Health Message Wins

M. CHAMBERLAIN, Church Pastor, Innisfail, North Queensland Conference

HE WAS a fat, chubby-faced young man whose unforgettable, dark, flashing eyes took my attention at the popular H.Q. (Fitness Assessment) check-up programme at Innisfail in late May, 1978. He was short, but powerfully built, and supporting a large stomach. I do not know who was more shocked when I told him he ought to see a doctor. His score had been one of the worst in the 700 who passed through that day.

Looking every inch a Greek, but speaking with a Scottish accent, Colin Lees quickly determined to engage in a physical exercise programme, associating with the "Good Life" fitness Campaign on Sunday mornings at beautiful Etty Bay, thirteen kilometres from Innisfail. His non-Adventist friends were frankly startled at the physical and spiritual transformation that was taking place. He began frequenting David and Leonie Harker's modern Adventist health food shop and asking lots of questions about diet and foods.

Over a period of six months, he lost approximately eighteen kilograms by refraining from junk food, not eating between meals, cutting out beer, and jogging between sixteen and thirty-two kilometres each week. The first time he ran, he managed 1.6 kilometres in about twelve minutes and felt awful. The last time I ran with him he could comfortably run thirteen kilometres in sixty minutes. He was a member of the "Good Life" men's team of five, which has now twice won the Innisfail Sugar Festival thirteen-kilometre road race in the two years it has been held.

Colin took on Bible studies every Wednesday evening, and after about four months decided to attend Sabbath school and church. He attended a short public mission in Innisfail and was baptised in February this year, having made a deep impression on a number of his non-Adventist friends around Innisfail. This gives another clear indication that our Health message, through the grace of God, wins souls.

Colin is now at Avondale College training to be a primary-school teacher. ##

Extract from:
Australasian Record, June 18, 1979. p. 2.

The effects of inbalance to the whole man when poor diet and exercise et cetera, are chosen.

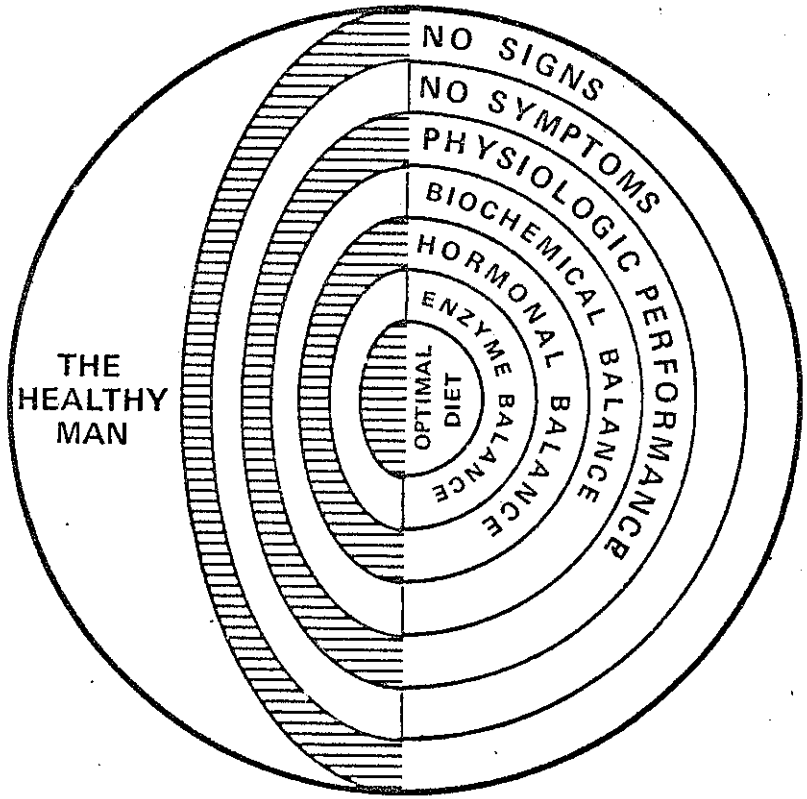


Figure 11-4. In healthy man all levels are in balance.

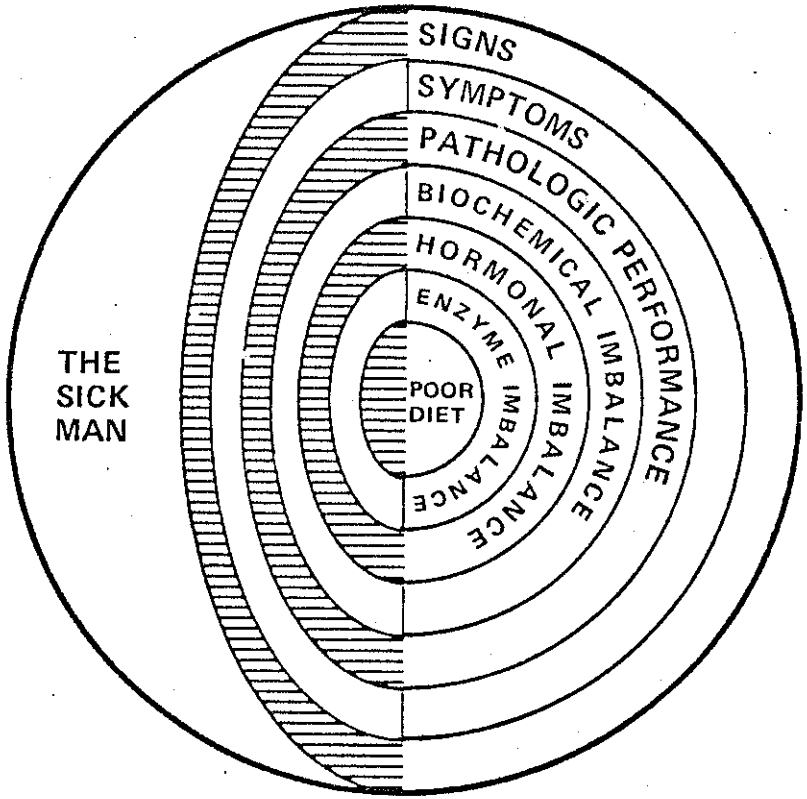


Figure 11-5. Following a core problem (diet, exercise, et cetera), there are eventual disturbances in order at the enzyme level, hormones, biochemical state, performance, and finally symptoms and signs.

Extract from:

E. Cheraskin and W. M. Ringsdorf, Predictive Medicine: A Study in Strategy (Mountain View, California: Pacific Press, 1973), pp. 118-9.

APPENDIX 9

McCAMY AND PRESLEY'S MEDICAL HEALTH QUESTIONNAIRE

Go down the list and give yourself 10 points each time you qualify as being in a particular risk category. Write down the figures on a piece of paper. The sum will be your total percentage risk for a coronary.

1. Male and over thirty-five years of age, or female and over sixty. We can do nothing about this one. If you are a female under sixty or a male under thirty-five you can note 0.

From now on, age and sex will not be a factor.

2. Cigarette smoking. (If you don't smoke cigarettes, 0. If you smoke a pipe or cigar, or if you've stopped smoking within the last five years, the risk is somewhere between 0 and 10, but we are rounding off figures to keep it simple.)

3. Anything but thin.

4. No regular exercise. ("Regular" means at least five days a week; to earn a 0 you must work up a sweat for at least twenty minutes, five days a week; stretching exercises, weekend golf or sitting in the sauna several times a week won't get you off the hook.)

5. Feeling tense a great deal of the time. (Admittedly, a vague thing, but important.)

6. Depressions and feelings of inadequacy much of the time. (Not just on rare occasions.)

7. A history of one or more persons in your family who has had a coronary or stroke before reaching sixty.

8. Consumption of any of the following: refined carbohydrates (sugar, white starch, doughnuts, sweets), junk meats (frankfurters, lunch meats, hamburgers), coffee, saturated animal fats.

9. Blood cholesterol level higher than 240 milligrams percent. (If you don't know, give yourself 5 points, to be sure.)

10. Blood sugar level over 120 milligrams percent or under 70, two hours after test began. If you don't know, make it 5 points anyway.

11. Uric acid over 6.5. If you don't know, 5 points.

12. Elevated blood pressure (138/88 or higher).

Theoretically, a person could add up more than 100 points on this test. It was purposely designed this way, not only for convenience in counting but also to emphasize the high risk status a person has if he or she combines many of the factors. Nevertheless, it provides a swift general means of assessing your own future health in this one respect.

Extract from:

McCamy and Presley, Human Lifestyling, p. 18, 19.

APPENDIX 10

Stress and mental ills assail Public Service

By BRIAN HILL

MENTAL illness and stress are becoming major problems for hundreds of police, teachers and other public servants in Victoria.

According to the report for 1980-81 of the State Superannuation Board, 248 of the 499 retirements from the Public Service due to ill health were due to "mental illnesses or mental disorders".

The report, which was tabled in the Victorian Parliament yesterday, says: "The board is very concerned with this increasing trend, and even though some steps have been taken to reduce the number of early invalidity retirements, further action is required."

A senior Victorian Government source last night confirmed that police – and to a lesser extent, teachers – formed the bulk of public servants who were forced to retire early on mental or psychiatric grounds.

"Police work is particularly stressful and many police, sometimes even people under 30, are finding themselves unable to cope," the source said.

"Some of these people have been under psychiatric care for months or years, and when they get to the board they're pretty sick.

"I understand other States are having similar problems."

The source, who would not be named, said much of the mental problems of police stemmed from being frequently involved in high-speed car chases, brawls and holdups, and having to work extremely long hours because of the Government's clamp-down on staff ceilings.

According to the source, staff ceilings also exposed teachers to extra stress and long hours, and like police were liable to be shifted around the State at short notice.

"The recent Beach Inquiry into alleged police corruption has also had a marked effect," the source said.

"Many police were named in the inquiry, but none of the accusations stuck and no-one was convicted of any charge.

"Obviously this would affect a person's chances of promotion and social standing, and the inquiry was just one more cause of stress within the force."

The president of the Victoria Police Association, Chief-Inspector Tom Rippon, last night confirmed that stress-related illnesses, particularly nervous breakdowns, were a source of increasing worry to his colleagues.

"Almost 70 per cent of our people who retire through ill health go out from stress-related illnesses," Mr Rippon said.

"In 1961, for example, six members of the force retired medically unfit while by 1979 the figure had grown to 107.

"Last year the number was 118.

"In the first six months of 1981 the figure was exactly 100 – and 70 per cent of these would have gone out because of a stress-related illness."

Mr Rippon said the Chief Commissioner of Police, Mr Mick Miller, was so disturbed at the trend that he had instituted an experimental stress-relief program within the force, placing special emphasis on relaxation techniques.

"There's no getting away from the fact that policing is a stressful occupation, but we are also 25 per cent understrength because of the Government's staff ceilings," Inspector Rippon said.

Meanwhile in Queensland, a study by the State Service Superannuation Board showed that in the three years ended June 1979, 26 per cent of retirements due to ill-health were caused by mental disorders.

The survey also showed that in 1979, 32 per cent of people receiving the ill-health pension had retired due to a mental disorder.

Extract from: THE AUSTRALIAN, 18 December, 1981

APPENDIX 11

A yardstick for personal stress

Although stresses affect each individual uniquely, their relative importance is remarkably uniform, as psychiatrists Thomas H. Holmes and Richard Rahe found in compiling the Social Readjustment Rating Scale (*right*). But some surprises turn up in its ranking of the impact of 43 common experiences on a numerical scale of Life Change Units. For example, the death of a close friend, usually considered extremely stressful, ranks well below such events as retirement or an illness in the family. On the other hand, certain joyful events, such as a marriage or a marital reconciliation, prove to be far more stressful than financial catastrophes like bankruptcy or the foreclosure of a mortgage.

While 5,000 subjects in Europe, the United States, Central America, Oceania and Japan agreed generally upon the ranking of the 43 stressful events, differences between cultures did appear. Among the punctilious Japanese, minor violations of the law did not rank at the bottom of the scale but near the middle, and an actual gaol sentence ranked second on their stress list.

Special circumstances within a culture also had an effect. For interviews with university athletes, the scale omitted such events as pregnancy and retirement, substituting others with surprisingly high LCU values; among them were "Being dropped from the team" (LCU value, 52) and "Troubles with the head coach" (35 LCUs). But in all groups, everywhere, the scale proved to have a grim usefulness as a tool for predicting stress-related illness: the higher an annual LCU score, the greater the likelihood of such illness.

Social Readjustment Rating Scale

Rank	Life event	LCU value
1.	Death of spouse	100
2.	Divorce	73
3.	Marital separation	65
4.	Gaol term	63
5.	Death of close family member	63
6.	Personal injury or illness	53
7.	Marriage	50
8.	Loss of job	47
9.	Marital reconciliation	45
10.	Retirement	45
11.	Change in health of family member	44
12.	Pregnancy	40
13.	Sex difficulties	39
14.	Gain of new family member	39
15.	Business readjustment	39
16.	Change in personal finances	38
17.	Death of close friend	37
18.	Change to different type of work	36
19.	Change in number of arguments with spouse	35
20.	Mortgage over £7,000	31
21.	Foreclosure of mortgage or loan	30
22.	Change in responsibilities at work	29
23.	Son or daughter leaving home	29
24.	Trouble with in-laws	29
25.	Outstanding personal achievement	28
26.	Wife begins or stops work	26
27.	Begin or end school	26
28.	Change in living conditions	25
29.	Revision of personal habits	24
30.	Trouble with employer	23
31.	Change in work hours or conditions	20
32.	Change in residence	20
33.	Change in schools	20
34.	Change in recreation	19
35.	Change in church activities	19
36.	Change in social activities	18
37.	Mortgage or loan less than £7,000	17
38.	Change in sleeping habits	16
39.	Change in number of family gatherings	15
40.	Change in eating habits	15
41.	Holiday	13
42.	Christmas	12
43.	Minor violations of the law	11

Extract from: Ogden Tanner and Editors of Time-Life Books, Stress (Great Britain: Time-Life International, 1976), p. 91.

Science and Religion/Norman L. Mitchell

You are what you think

The dramatic effect of the mind on physical well-being has been recognized for centuries by both medical practitioners and nonprofessionals alike despite the lack of specific explanations. "A merry heart doeth good like a medicine" (Prov. 17:22), Solomon declared some three millenniums ago; the scientific validity of this truism is being verified by present-day medical technology.

Demonstrable mental control of the "involuntary" body processes goes back many centuries. Zen and Yoga practitioners can control their heart rate, change the temperature in localized regions of the body, and control various other physiological functions normally considered outside of the conscious will. Primitive fire dancers walk barefoot on burning coals to the amazement of those watching. Much of the doubt regarding such phenomena has now been removed by the development of the currently popular science of biofeedback. Since 1968, when Joe Kamiya first published his findings that people can control their own brain waves, biofeedback has undergone much refinement. By the use of such recording devices as the electroencephalograph (EEG) people can now be taught to observe the so-called alpha waves of the brain and by so doing learn to relax, overcome fear, control hormone secretions, and, according to some investigators, even cure migraine headaches, insomnia, and certain diseases.[1]

An experiment performed by brain researcher Paul Pietsch in 1972 dramatically demonstrated the fact that body activity is under direct control of the brain. Pietsch removed the brain of a salamander—an animal that normally feeds on worms and other invertebrate animals—and transplanted in its place the brain of a leopard frog tadpole, an animal that feeds on plant life. Surprisingly, the salamander survived the operation and thenceforth refused to eat worms, but fed instead on the plant life that the tadpole normally eats.[2]

The Bible, although not a book dedicated to science, provides remarkable evidence of the effect of the mind on the body. Luke 8 tells of a man who, being possessed by devils, was able to break all the chains and fetters used to bind him, a feat impossible for a person in his normal state. Verse 35 indicates that when Christ cured him he was returned to his "right mind." Ellen White also spoke of the influence of the mind in curing disease: "The relation that exists between the mind and the body is very intimate. . . . The condition of the mind affects the health to a far greater degree than many realize. . . . Disease is sometimes produced, and is often greatly aggravated, by the imagination. Many are lifelong invalids who might be well if they only thought so."—*The Ministry of Healing*, p. 241.

Recent scientific literature provides strong confirmation. Dianne Hales, former editor of *New Physician* and contributing editor of *Science Year*, claims that personality affects vulnerability to disease. Among her supporting evidence the author relates the portrait that researchers have developed for a rheumatoid arthritic: "A person who is shy, inhibited, self-sacrificing, perfectionist, incapable of expressing anger and hostility, and often troubled by unresolved tensions." She proposes that just as the negative emotions wear away our resistance to illness, positive emotions such as joy, love, and affection may preserve and restore our health.[3]

Additional support comes from Norman Cousins' experimental evidence on the curative effect of the placebo. In one experiment half of a group of patients with bleeding ulcers was given a prescription described as a "new and very effective" drug. The other half was given the same prescription but were told it was a "new experimental" drug that was being tested. Seventy percent of the first group were helped significantly, while only 25 percent of the second group were helped. Actually, both groups were given a placebo, Similar results were obtained with patients being

treated for mild mental depression who were given placebos after their regular antidepressants were withdrawn. Cousins quotes one researcher, Dr. Arthur K. Shapiro: "Placebos can have profound effects on organic illnesses, including incurable malignancies." In Cousins' own words, "the placebo is not so much a pill as a process. . . . The placebo is the doctor who resides within."[4] The consensus of experts studying the placebo effect seems to be that the patient's confidence in the doctor administering the placebo activates the brain, which turns on the body's endocrine system to produce hormones that regulate the body's physiology in controlling disease.

The fact that mental stress may have dramatic effects on body physiology recently received strong confirmation from cancer researcher and microbiologist Dr. Vernon Riley.[5] His work was designed to test the various effects on mice of such stressful situations as fright, overcrowding, and handling. He was able to demonstrate that among the many biochemical changes that occur as a response to anxiety there is a marked increase in the secretion of corticosterone from the adrenal cortex under activation by the hypothalmus of the brain. This increase in corticosterone levels results in a dramatic lowering of the body's immune response to disease as a result of a reduction in the number of circulating lymphocytes (white blood cells that fight invading germs), a decrease in size of the thymus, a gland that is intimately involved in disease resistance, and a loss in the tissue mass of the spleen and lymph nodes. These stressed animals showed a marked reduction in their resistance to viral infections and other diseases under immunological control, and were less capable of defending themselves against introduced cancer cells. In addition, tumor growth was greatly enhanced in the mice when two to twenty were placed in a single cage as compared to one mouse per cage.

J. P. Henry and J. Meehan support Riley's findings regarding the effect of the emotional state on kidney secretions. Their book *Brain, Behavior and Bodily Disease* points out that the adrenal medulla releases potent chemical neurotransmitters when fear or rage is a component of the inciting stimulation. In fact, growing awareness of the mind-body relationship in controlling disease has led to the development of a new discipline, called psychoneuroimmunology, within the field of behavioral medicine.

Recently, neurophysiologist Leslie L. Iverson offered the intriguing suggestion that the brain may have some undiscovered anxiety-producing and -relieving substance.[6] Such an observation may well be true; people's moods and behavior can be easily altered by taking various psychotropic agents such as tranquilizers, sedatives, stimulants, and hallucinogens. These agents are effective because they often mimic or counteract naturally occurring chemicals that function within the nervous system.

Several such brain-mediating chemical agents, called neurotransmitters, are known to modern medicine. According to Iverson, some thirty are known or suspected to be transmitters in the brain. (Some scientists estimate as many as a hundred.) Many of these are also known to be involved in the control of emotional states. According to Richard Restak, adrenalin, noradrenalin, and dopamine are naturally occurring neurotransmitters that are known to be involved in arousal, rage, fear, pleasure, motivation, and exhilaration.[7] He further points out that such depression-producing drugs as reserpine produce their effect by causing the disappearance of the natural neurotransmitters serotonin and noradrenalin. Thus drugs that restore the normal levels of these transmitter substances or increase their effectiveness function as antidepressants.

Neurotransmitters function at specific sites of the nervous system called synapses. These tiny gaps between the ends of interconnecting nerve fibers serve to regulate the passage of nerve impulses. Some synapses have a stimulatory function and enhance the passage of impulses from fiber to fiber. Others have an inhibitory function, preventing the passage of some impulses, and consequently preventing the body from responding to irrelevant stimuli. Whether a synapse is excitatory or inhibitory depends partly upon the type of transmitter substance secreted by the nerve ending at the synapse, and partly on the nature of the receptor site on which the transmitter acts. When both excitatory and inhibitory fibers converge at synapses, it is the sum of the excitatory and inhibitory effects that determines whether or not a neuron (nerve fiber) will fire and produce an impulse. Since a person's mental state can regulate brain chemistry, the type of transmitter substances released most abundantly in the brain will depend largely on the person's cultivated mood. The longer a particular pattern of thought is entertained, the greater will be the effect

of the associated transmitter on brain physiology. Some brain researchers now say there is no twisted thought without a twisted molecule.

It is important to note that brain cells that produce particular transmitters are not randomly distributed in the brain, but are located in specific clusters. Consequently, various physiological states and moods can be induced by stimulating specific areas of the brain. According to reports from various researchers, significantly diverse reactions can be produced by activating brain centers separated by no more than a few millimeters. The significance of this point lies in the fact that repeated use of a particular neural circuit produces changes that make it progressively easier to use that circuit. This, as David Hubel (a 1981 Nobel laureate) suggests, may be the basis of memory enhancement by repetition.[8]

A particular combination of stimuli, if repeated, might enhance one possible pathway among many in a neural structure. If so, then a person may cultivate specific moods by habitually thinking certain thoughts, and since these moods emanate from brain structures that release specific transmitters, these frequently used brain pathways produce characteristic behavioral patterns. Thus a happy attitude, consistently cultivated, becomes a physiological phenomenon that is fixed in the nervous system and gradually becomes automatic. As Paul puts it, "Beholding as in a glass the glory of the Lord, [we] are changed into the same image" (2 Cor. 3:18). If, as Solomon says, "a merry heart doeth good like a medicine," then physical well-being will result. A morose attitude will have the opposite effect.

Medical technology is suggesting that thought patterns *can* affect a person's health by releasing in the nervous system chemical agents that have dramatic effects on body physiology. Thus happy, pleasant thoughts may produce a feeling of exhilaration because they are mediated by neurotransmitters that have a stimulatory effect, while thoughts of gloom, anger, or resentment may produce chemicals that have a depressing effect or reduce the body's capability to resist disease.

If a person's thought pattern can affect his health, then mental processes must also have a strong influence on spiritual well-being, for it is through the mind that man communicates with God. Paul's admonition "Let this mind be in you, which was also in Christ Jesus" (Phil. 2:5) suggests that what we are in our thinking is what we are in reality. We are not necessarily what we think we are; rather what we think, we are! Our words, our actions, and our attitudes are all expressions of our thoughts, our true selves.

The realization that thought patterns can become fixed by repeated use of the neural circuits that produce them should strongly motivate Christians to take seriously Paul's counsel in Philippians 4:8 to think on those things that are true, honest, just, pure, lovely, and of good report. Isaiah declares that God dwells with those who are of a contrite and humble spirit (see chap. 57:15). The suggestion is that the abiding presence of the Holy Spirit will remain with us only when the mind is kept in a state of constant receptivity. This receptive state can be cultivated through the habit of meditation and prayerful awareness of God's presence. "Pray without ceasing," we are admonished (1 Thess. 5:17). This state is described by Ellen G. White in these words: "If we consent, He [God] will so identify Himself with our thoughts and aims, so blend our hearts and minds into conformity to His will, that when obeying Him we shall be but carrying out our own impulses."—*The Desire of Ages*, p. 668.

Just as repetition deepens impressions on the mind, it appears that repeated suppression of certain neural processes may result in a gradual lessening of the ability to respond to the associated mental stimuli. This has been shown to be true in such simple invertebrate animals as mollusks. In his study of neural circuits in the mollusk Aplysia, brain researcher Eric R. Kandel showed that habituation, a gradual decrease in the strength of a behavior response to a specific stimulation, results from a progressive decrease in the amount of transmitter conveyed from the nerve cells to the target cells they innervate.[9] After eight days of habituation, 30 percent of the synaptic connections were no longer effective. Although one cannot safely make correlations between the neural processes of lower animals and those of man, the implication is strong that permanent changes may take place in the nervous system when certain neural pathways are not used because of the suppression of the stimuli that would activate them. Thus it may become progressively more difficult to respond to suggestions of the Holy Spirit if we habitually suppress repeated urgings to respond.

The mind is the medium through which God communicates with man. It is man's mind that makes him human, created in

God's image; and it is by the renewing of the mind that we become sons of God. The power of the mind to influence body and spirit cannot be overestimated. Both our physical and our spiritual well-being are dependent upon good mental health.

Modern medical studies are verifying the ancient wisdom of Solomon. A spirit of gratitude and praise apparently *does* promote health of body and soul. Is it not, then, a positive duty to resist melancholy, discontented thoughts and feelings? As much a duty as it is to pray? There is every reason for Christians to be the happiest people on earth, and, if Solomon is correct, the healthiest as well!

[1] Scott Morris, S. Wilson and R. Roe in *Readings in the Life Sciences*, (New York: West Publishing Co., 1975), p. 247.
[2] Paul Pietsch, "Shuffle Brain," *Harper's*, May, 1972, p. 41.
[3] Dianne Hale, "Psychō-immunity," *Science Digest*, November, 1981, p. 12.
[4] Norman Cousins, "The Mysterious Placebo," *Saturday Review*, Oct. 1, 1977, p. 8.
[5] Vernon Riley, "Psychoneuroendocrine Influence on Immuno-competence and Neoplasia," *Science*, June 5, 1981, vol. 212, p. 1100.
[6] L. L. Iverson, "The Chemistry of the Brain," *Scientific American*, September, 1979, p. 134.
[7] Richard Restak, "Psychochemistry of the Brain," in *Mind and Super-mind*, edited by Albert Rosenfeld (New York: Holt, Rinehart and Winston, 1977), p. 88.
[8] David Hubel, "The Brain," *Scientific American*, September, 1979, p. 44.
[9] Eric R. Kandel, "Small Systems of Neurons," *ibid.*, p. 66.

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Extract from:

Norman L. Mitchell, "You Are What You Think," Ministry Vol. 55, May 1982, No. 5, pp. 27-29.

APPENDIX 13

POSITIVE ADDICTION

It would appear that there is in man's experience, a correlation between addictivity and personality. Stanton Peele suspects that many people are unaware that they have an addiction. This may be unresolveable when a person cannot obtain the means of overcoming a particular excessively protective environment. Dependency is more than a matter of body or drug chemistry, "it is an experience." (p. 6), and can be associated with almost anything. Stanton Peele and Archie Brodsky suggest that: "Interpersonal addiction--love addiction--is just about the most common yet least recognised form of addiction." (p. 5) This addiction is toward people--"the human environment" (p. 5) and the only way to be released from this is through learning better ways of handling people. The causes of this can be seen in:

> Excessive parental supervision, artificial supervision, artificial criteria for learning, and a reverential attitude towards established institutions, such as organised medicine--along with other cultural influences, combine to leave us without moorings in our direct daily experience. (p. 7.)

Mature love, or real love comes from the "integrity of being, in two individuals who come together to share, not out of passive dependence but out of surety and strength." (p. 8.) Mature love does not decrease the scope of influence of one's life. It is not a dependency that hooks onto someone as an object.

People who are addicted in what ever way, are those who "lack desire--or confidence in their own capacity--to come to grips with life independently...The addict is not a genuinely rebellious person. Rather he is a fearful one." (p. 55.) He is eager to rely or lean on people, institutions, or things. Through this he becomes a psychological invalid and is readily exploited by the highest bidder. "Disbelieving his own adequancy, recoiling from challenge, the addict welcomes control from outside himself as the ideal state of affairs." (p. 55.)

Peele and Brodsky's definition of addiction exists

> ...when a person's attachment to a sensation, an object, or another person is such as to lessen his appreciation of and ability to deal with other things in his environment, or in himself so that he has become increasingly dependent on that experience as his only source of gratification. (p. 56.)

This activity leads to a further disgust with himself and heightens anxiety. In turn, fear of failure is increased, new things are avoided and "safe" routines and rituals are alone sought. This vicious circle only serves to decrease confidence in the person and his coping-relating abilities are slowly extinguished.

If most people are addicted to something or someone, one of the difficulties in explaining this is in the connotation that addictiveness can be negative. People may be addicted to T.V., work, sex, money, power, self-image making etc. These may be regarded as negative addictions because they have potential for abuse rather than positive enhancing uses and effects.

The key to "positive addiction" is in the goals, motives and methods of achieving it. Eggers cites William Glasser:

"... positive addiction enables one to work more effectively, love more beautifully, appreciate the things around more, and to grow, change and expand."

Glasser has formed six criteria for an activity to become positively addictive. It must be:

1. Non-competitive
2. Easily done with little mental effort
3. Able to be accomplished alone
4. Have mental, physical, or spiritual value
5. See results (subjective)
6. Be done without threat of criticism (p. 93.)

Positive addiction, according to Glasser, is a choice that people can make. It has worth and is able to help in the building of their own self-worth (p. 52). He considers that: (1) Positive addiction increases mental strength while negative addiction including drug taking, usurps it. (2) Positive addiction does not dominate one's life as in negative addiction and that mental strength is gained in order to pursue a chosen course. (3) In return a certain fulfilment is received in love and warmth with the deriving of pleasure, meaning and zest for life.

The dangers underlying Glasser's concept of positive addiction are seen in the potential abuse from:

1. Its lack of discernment in motive, e.g. the pursuit of absolute hedonism
2. Its heavy reliance on one's self alone or "one's own brains"
3. The emphasis on doing things alone for true fulfilment
4. The danger of reliance on feelings alone in looking for a state of well-being

> An addict thinks that he needs only himself to find fulfilment in pleasure, while non-addictive persons find their happiness in others. This would appear to be common to positive and negative addictiveness (p. 40).

Peele understands the differences between positive and negative addiction to be "...seeing the world as your arena and seeing the world as your prison." (Eggers, p. 53.) While for Glasser, "...positive addiction...strengthens us and makes our lives more satisfying...whereas negative addictions...weaken and often destroy us." (Glasser, p. 36.)

Glasser defines negative addiction as someone "who is severely frustrated by his own particular search for love and worth...in his attempt to find well-being and happiness he tears his life to shreads." (p. 30.)

Extracts from:

Stanton R. Peele and Archie Brodsky, Love and Addiction (New York: Signet, 1976).

William Glasser, Positive Addiction (New York: Harper and Row, 1976).

Gary Eggers, "Sport and Drug Addiction," Unpublished Manuscript, Department of Youth, Sport and Recreation, N.S.W. Health Commission, 1981).

APPENDIX 14

BIOCHEMICAL EFFECTS OF AEROBIC EXERCISE

Dr. Otto Appenzeller states that:

It is common to find abnormally low levels of hormones called catecholamines in the brains of depressed patients. Anti-depressive medications work by interfering with the reduction of catecholamines, thereby maintaining a satisfactory level of these substances in the brain. We studied the levels of catecholamines in runners before and after a marathon, reasoning that if running does help cure depression, we might be able to prove it with evidence of increased levels of thse hormones in the runner's blood.

We measured catecholamine levels in 10 runners immediately before a marathon and at seven, 13 and 20 miles into the race. In another marathon, we measured catecholamines before the race and at four one-hour intervals after its completion. The runners' times ranged from 2:22 to four hours. The catecholamines increased by 300 percent above baseline levels at the seven-mile mark and remained unchanged for the remainder of the race. A further increase to 600 percent above baseline was noted after the race, but within one hour these levels returned to normal. We concluded that in well-trained endurance athletes, high levels of catecholamines can be reached during a race, but these levels do not last for long.

We also studied the effects of running and endogenous opioids, other substances in the brain related to mood and pain. One of these, beta-endorphin, is thought to be one of the most powerful naturally occurring painkillers in the body. We measured levels of beta-endorphin in the blood of 15 endurance runners before and after the Sandia Crossing Wilderness Run, in a 28.5 mile race near Albuquerque. The run started at an altitude of 6200 feet and climbed to 10,600 feet along a mountain trail. An almost 100-percent increase in beta-endorphins was found in the runners at the end of this run. The increase was much more pronounced in younger runners than in master runners, but during the race, both age groups had proportionately similar levels of the substance.

Although we found that beta-endorphin levels remained high in the runners for three or more hours after the run,

> we don't know yet whether they account for the "runner's high" that many distance runners experience. But after the Sandia run, we did make one other interesting discovery. To our great surprise, the runners' vitamin C levels had increased when compared to baseline levels obtained the night before. We have no explanation for this finding. Vitamin C is considered a stress vitamin, and its level in the body was expected to drop considerably after such a long run. Past studies have suggested that vitamin C cannot be stored in the human body for long, and runners in the Sandia race were given only water at aid stations.

Extract from:

Otto Appenzeller, "Does Running Affect Mood?" Runner's World, April 1981, p. 13. (Dr. Appenzeller is attached to the New Mexico Health Enhancement and Marathon Clinics Research Centre at Albuquerque New Mexico.)

APPENDIX 15

WHAT YOU SHOULD KNOW ABOUT EXERCISE

VARIETY	Because your body adapts, and because no one exercise will affect all the muscles of the body, engage in several different types of activity.
SLOW PROGRESSION	If you're out-of-shape, gradually build up.
PROPER WARM-UP	To minimize injury and unnecessary muscle strain, warm up before strenuous exercise.
TRAIN, DON'T STRAIN	Exercise within your tolerance. Don't over-do it!
COOL DOWN SLOWLY	Walk to ease the transition between activity and rest.
TIME OF DAY	Whatever time works for you. Just make it regular.
MUSCULOSKELETAL PAINS	These happen, usually, when you're out-of-shape, or when you have improper running shoes, or an improper running style, or weigh too much.
RUNNING STYLE	(1) Keep your body straight up and down (don't lean or bend); (2) look 20 feet ahead; (3) keep the arms at a 90° angle, relaxed, and don't cross them in front of the body; (4) land almost flatfooted with weight back towards the heel, then thrust off toes; (5) breathe through mouth and nose; (6) avoid wasted action; (7) overall--be loose, natural yet poised.
TEMPERATURE/WEATHER	From 0° to 95°, no problem. Otherwise curtail activity. Rain? Keep running. Cold? Dress for it. Heat? Drink water. Smog? Early morning activity.
ALTITUDE	No compensations at 5,000 feet and below.

CLOTHING	Loose, comfortable clothing is needed. You don't have to invest in a jogging suit. Women may want to use a supportive bra for comfort.
FEELING ILL	Engage in light activity only; nothing vigorous.
MEAL TIMES	The limits are two hours after, or one hour before (vigorous activity).
RUNNING SHOES	Invest in a good pair--padded, arched, light, durable. This is a must if you are serious about not injuring yourself when you are jogging.
WALKING	Walking briskly up and down hills is best. Not recommended for persons under 25, but check with your doctor before starting any exercise program.
INDOOR EXERCISE EQUIPMENT	Skipping rope is best. But reserve this only for days when you can't get outdoors.
EFFORT	Yes. Lot's of effort. You are going to sweat, huff, and puff at 70 percent maximum heart rate. If you've been out of it for a while, it'll take six-eight weeks before you enjoy regular exercise.
COMPETITION	Not with others, but with yourself.
REST	If you exercise, you must rest. Exercise tears down and rest builds up. This means that when you exercise you will need your full eight hours of sleep.
WATER	Sweat must be replaced. Exercising people need at least eight glasses a day.
DIET	Use fresh, natural foods. Avoid overeating as a reward for exercise. (You burn 100 calories per mile of running.)
ENJOYABLE	In regular, aerobic exercise, you must first undergo a difficult learning process. Then, with discipline, exercise becomes enjoyable.

HOW LONG	Exercise is something that you should plan to begin now and keep it up for the rest of your life.
MEDICAL EXAMINATION	If you are over 30, check your doctor first.
THE LAW OF USE	If you don't use your body, it breaks down. Every person has two doctors--his right leg and his left leg.

Extract from:

David Nieman, "What You Should Know About Exercise," Focus 14(Summer 1978):34-35.

APPENDIX 16

DOES YOUR FAVORITE EXERCISE KEEP YOU FIT?

See what the experts have to say
about your best-loved sport

by C. Carson Conrad

It is a well-known medical fact that when a person is immobilized for long periods of time or confined to bed, the bones lose their functional efficiency, the somatic muscles rapidly become weak and flabby, and the heart and circulation lose their tone and ability to respond to even the slightest stress. One of the most striking medical findings of the eleven Apollo moon missions was the revelation of the extent and rapidity with which these degenerative changes developed in space, where confinement and lack of gravity reduced exercise to a minimum.

This and many other studies clearly demonstrated that use and exercise are necessary to maintain the functional integrity of various body systems. But what kind of use and what kind of exercise will best promote the highest level of efficiency of the body? Our panel of seven medical experts selected fourteen popular but diverse forms of exercise for evaluation in terms of their special contributions for physical well-being. Some of these, such as basketball, and tennis, can be regarded as "sports"; others such as calisthenics, walking, and jogging, are more commonly looked upon as merely popular forms of exercise. The evaluation of the fourteen different forms of exercise was made in terms of regular participation (a minimum of four times a week) and vigorous activity (duration not less than a half-hour).

Jogging

Fox: The most efficient and inexpensive approach to enhancing endurance capacity. Must be approached with warm-up preliminaries and a "starter" program of walk-jog alternations.

Lamb: this is an endurance exercise that will not build muscle mass beyond the natural size of the body. Running faster and faster is not a great advantage. It takes almost the same amount of energy (calories) to run one and a half miles in sixteen minutes as it does to run it in eight minutes. I estimate an average of 720 calories per hour.

Ryan: A great activity to promote fitness. The results come slowly, however.

Kraus: Excellent for cardiovascular fitness; unfit people should start with a calisthenics program first to attain minimum muscular fitness, otherwise muscle strain, back pain, et cetera, often result.

Gendel: Excellent "all-round" activity, especially the ability to begin in stages at any age. Beneficial to body systems, even those that have been subject to debilitating disease and need rehabilitation.

Guild: Plus--can squeeze a maximum consistent effort into a minimum amount of time. Minus--can be boring.

Klumpp: One can adjust the pace and distance to one's own particular condition and fitness.

Bicycling

Kraus: Good fitness-building activity, primarily cardiovascular. Calorie-consuming.

Klumpp: Bicycling with the pedal at the instep fails to give maximum extension to the ankle and foot. It is important to adjust the seat so that the leg is fully extended when the pedal is at the bottom of the circle.

Ryan: A great fitness activity when indulged in regularly at a good steady pace.

Guild: Plus--good for endurance and can be done alone (thus no need to program this into other people's schedules). Minus--ice, snow, fog (rain is OK).

Gendel: A "forever" activity in health and fitness. It rates high for development of leg and back muscle strength.

Fox: Excellent if vigorously pursued. Good endurance-generating exercise.

Lamb: An endurance exercise. Estimate 400 calories per hour, depending upon speed and road conditions.

Swimming

Guild: Plus--good for total body conditioning; a nonweight-bearing sport, it's good for people recovering from hip, knee and ankle problems. Minus--requires availability of a pool.

Fox: Excellent as endurance-stimulater and for total body development. Is important that all citizens be comfortable in the water

to avoid high incidence of drowning deaths. Must be a part of school curriculum requirements.

Klumpp: Magnificent exercise, but it neglects the weight-bearing, antigravity musculature of the body and should be balanced by something like jogging for ideal, all-round muscular development.

Gendel: One of the excellent all-round physical activities.

Ryan: Excellent for fitness. As good as running if you can swim well enough.

Kraus: Excellent for fitness maintenance and for cardiovascular fitness.

Lamb: Primarily an endurance exercise; depends on speed and stroke used; estimate 500 calories per hour on the average.

Ice-Skating/Roller Skating

Gendel: Most people don't indulge in these sports unless they do them well, which means they learned them early in life; excellent sports once learned and used.

Klumpp: Skating does a lot for the pelvis and legs; for ideal all-round development, it should be supplemented with upper body exercise.

Fox: Good endurance effects with delightful social attributes at modest cost; satisfying skill and agility aspects.

Kraus: Good for fitness building and maintenance for people who have the necessary muscular fitness.

Ryan: Both are great for fitness when done on a vigorous basis.

Guild: Plus--good for endurance and agility. Minus--not enough indoor and outdoor rinks.

Lamb: Estimate 640 calories an hour. Primarily an endurance exercise.

Handball/squash

Klumpp: When vigorously played, provides a maximum exercise in a minimum of time.

Fox: Excellent endurance stimulation. Should warm up prior to play. Demands of ligaments and joints may cause problems in middle to later years.

Kraus: Good fitness-maintaining sport if played regularly by fit people.

Gendel: Excellent on almost all counts because of the agility it promotes.

Guild: Plus--good for endurance and agility. Minus--there aren't enough courts.

Lamb: Vigorous endurance-type exercise; estimates 1,000 calories per hour.

Ryan: Largely an aerobic activity. Will keep you fit if played on a regular basis, however.

Alpine skiing-downhill and slalom
Nordic skiing-cross-country and jumping

Lamb: Alpine--mostly an endurance exercise, estimate 540 calories per hour. Nordic--also an endurance exercise, but uses more calories; estimate close to 1,000 per hour.

Kraus: Alpine--can maintain and improve fitness. It is especially important to have good basic muscular fitness, otherwise there is great exposure to injury. Nordic--excellent for fitness; need to be preconditioned to gain maximum muscular fitness.

Fox: Alpine--some endurance-stimulating value; excellent for leg and back development. Nordic--excellent endurance-stimulating activity with good arm-shoulder development.

Klumpp: Both are excellent sports and offer the additional advantage of the metabolic stimulation provided by low temperatures.

Guild: Alpine--plus--good for agility; minus--expensive. Nordic--plus--good for endurance; minus--requires equipment and usually travel time.

Gendel: Alpine--except for the high-risk factor for injury, this can be excellent. Nordic--long-term carry-over activity.

Ryan: Alpine--does little for fitness, but you must be fit to avoid injury. Nordic--a great sport to promote endurance.

Basketball

Ryan: A sport for the already fit. You don't play basketball to get fit; you must be fit to play it.

Guild: Plus--good for endurance and agility. Minus--try to find ten guys four times a week!

Lamb: Uses lots of energy, about 1,000 calories per hour for the average adult.

Kraus: Good fitness-maintaining sport if played regularly by fit people.

Gendel: Obviously contributes to general fitness and health, but because of its team nature, it may or may not lead to ongoing, carryover "life" activities.

Klumpp: From a physical-fitness standpoint, an excellent sport.

Fox: Excellent endurance-generating exercise with great stimulus for enhancing coordination, agility. Good for school and college years. Moderate hazards of injury and strain on joints and ligaments may discourage post-collegiate involvement.

Tennis

Ryan: If you run for the balls, it's a great game to keep you fit.

Gendel: An excellent all-round activity that may carry some of the same anxiety levels inherent in golf and other sports where people worry about their game.

Klumpp: Splendid exercise for almost all purposes except bilateral symmetrical upper-body development; its value for the development of cardiovascular fitness depends on the manner in which one plays.

Fox: Excellent for body shaping, flexibility, and balance; stimulates endurance if vigorously played.

Lamb: Moderate endurance exercise--estimate 500 calories per hour.

Kraus: Good for cardiovascular fitness and muscular fitness.

Guild: Plus--good for endurance and agility. Minus--seasonal, not enough indoor courts.

Calisthenics

Kraus: A good calisthenics program should contain relaxation and limbering exercises, should build up slowly from relaxation to warm-up to workout and then return to cool-off and finally relaxation.

Fox: Flexibility enhancement, very useful for most ages. Endurance stimulation may not be great unless rigorously pursued.

Klumpp: Its value rests entirely on the vigor of the exercise program; properly prescribed exercises are particularly valuable for muscle and joint flexibility and back problems.

Guild: Plus--good for total body conditioning if done for strength and stamina and not for muscle hypertrophy. Minus--boring.

Lamb: Can develop muscle mass and can be both endurance and strength-type exercise.

Ryan: When these are scheduled in a circuit training program, they promote physical fitness very well.

Gendel: Can be done alone, in pairs, in groups, and can involve music and experimentation with body mechanics.

Walking

Fox: Excellent for reconditioning, but not a great added stimulus for those in "good" condition.

Klumpp: Excellent if one has time to walk far enough, fast enough. Ideal for the lame, blind, halt, and decrepit!

Kraus: Excellent. But requires more time and faster walking to attain cardiovascular fitness.

Ryan: Great for fitness if done at a brisk, steady pace.

Gendel: Excellent exercise because anyone can do it--alone, in pairs, in groups, et cetera. Can be graduated in intensity for any age or physical limitation.

Guild: Plus--good for endurance, especially when combined with normal, daily activities. Minus--takes a lot of time unless pace is brisk.

Lamb: Moderate endurance exercise--estimate 250 calories per hour.

Golf

Klumpp: A fine recreational pastime, but as played today utilizing a caddy and/or a golf cart, it provides so little exercise that it is practically useless from the physical-fitness standpoint.

Ryan: Does little or nothing for fitness unless you walk and carry your clubs or play on a hilly course.

Kraus: Little fitness value.

Guild: Plus--good for relaxation and camaraderie. Minus--little physiological benefit, and it's expensive.

Gendel: The large social and club element associated with it often offsets its ability to accomplish positive points. Continual "fretting" about one's game does not help digestion or sleep.

Lamb: An endurance-type exercise; uses about 300 calories per hour.

Fox: If walking and carrying a bag of clubs, golf has moderate stimulus for aerobic endurance for those of only moderate or less fitness, but caddies and electric carts lessen these aspects.

Softball

Guilt: Plus--few injuries; good for agility. Minus--too much time sitting around doing nothing.

Klumpp: Good fun. Excellent recreation, but too little exercise.

Kraus: No good to create fitness; not too valuable for fitness maintenance, either.

Ryan: Does little or nothing for fitness.

Lamb: Moderate exercise; estimate 230 calories per hour, except for pitcher who may use an additional 100 calories.

Fox: Pleasant activity with skill and agility benefits.

Gendel: Depends once again, on involvement in the activity, and may or may not have lifelong value.

Bowling

Fox: A pleasant recreation but not useful in enhancing fitness. May eat and drink more calories than activity burns up.

Ryan: Does nothing to promote physical fitness-just a good game.

Klumpp: Not enough exercise to have a pronounced effect on physical fitness, but it's better than nothing.

Lamb: The lightest exercise in the group. Estimate only 150 calories an hour. It won't do as much for you as a good walk.

Kraus: Little fitness value.

Gendel: Its social nature for the general public is associated with opportunities for food (and beverage) intake.

Guild: Plus--good for recreation, skill and camaraderie. Minus--no significant physiological benefits.

Some Opinions on other sports and exercises

About volleyball, canoeing, water-skiing, and horseback riding, Dr. Fox says: "Volleyball is less demanding than basketball and can be easier to organize teams with odd numbers and less-equal skills than with basketball. A good mix of exertion and sociability.

"Canoeing is good total body exercise if done vigorously as in stream or whitewater paddling (with associated hazards).

"Water-skiing is good fun but noisy, and it needs expensive equipment. Largely isometric, with anxiety component, which makes it not good for heart-disease patients.

"Horseback riding provides good exercise but it is expensive and there is some hazard."

Dr. Lamb points out that "unless they are included in calisthenics, we have ommitted real strength-type exercises, such as muscle training or weight training, from our consideration. That is a mistake, because developing good strong muscles is part of maintaining good posture, which is important to health as well as appearance."

About team sports, Dr. Kraus says, "For school-years fitness, team sports and any other sports should come second to fitness-creating activities, which include jogging, running and calisthenics for basic minimum muscular fitness. Team sports are most likely to backfire and give only the most fit a chance to compete, leaving on the sidelines the ones who need the activity the most."

And Dr. Gendel points out that "fitness activities of a team or group often cannot be guaranteed to continue throughout life. Also, sometimes anxiety issues related to team activities cause digestive, nervous, or distractive influences affecting sleep, et cetera."

General Summary

Including their comments, Dr. Klumpp and Dr. Lamb pointed out that, in each one of the sports listed, there is an x ingredient. this ingredient is the way one engages in the sport or exercise. Dr. Klumpp said, "I used to bowl with a friend who stood almost motionless and gently waved the ball toward the pins, and they usually all gently fell over, whereas I would get to the back of the alley, rush to the line, and hurl the ball with as much vigor as I could muster--and I could never beat my friend. He got the scores, but I got the exercise.

"In tennis, I have friends who consider it a waste of energy to run for the ball on the theory that even if you get it, you are so out of position that your opponent can put it away. I have never seen such players in much of a sweat or out of breath. I run for everything, and surprisingly often, even a poor return is flubbed by the opposition. Here again the calories expended and the cardiovascular stimulation depend on how one plays the game."

A general principle of great importance, in Dr. Klumpp's opinion, is the necessity of bringing about stress in exercise programs, if one engages in exercise to maintain or improve body and cardiovascular fitness. Many who do not understand biophysiology regard stress as something to be avoided. They are partially right if one thinks of extremes of stress, but in all human endeavours an insufficient amount is worthless and too much is harmful. "This is true of almost everything," says Dr. Klumpp.

Dr. Kraus stressed that minimum muscular fitness is a precondition for all sports in order to avoid injury, and that the inclusion of limbering exercises is essential.

Last, and perhaps most important, Dr. Guild, who is past president of the American College of Sports Medicine, pointed out that "time is of the essence." After all, how much time can a busy person reasonably expect to allot to physical fitness?

"(A) None, if he has no interest ('I'm too busy, but when I find time...')--forget it.

"(B) A minimum of 30 minutes four to five times a week is ideal and not unreasonable, because maximal benefits toward endurance or stamina are 'promoters' of cardiovascular reserve. There are four S's in sports--speed, skill, strength, and stamina. The first are of interest to the young. The last (stamina) adds to longevity, to vigor, to joie de vivre, to one's ability to do a day's work effectively and yet to have enough pep left over to enjoy leisure time."

The seven experts on physical fitness

Samuel M. Fox III, M.D.
Professor of Medicine, Georgetown University; former president, American College of Cardiology, former chief, Heart Disease Control Program, USPHS.

Evalyn S. Gendel, M.D.
Assistant Director, Bureau of Maternal and Child Health, Kansas State Department of Health and Environment, adjunct professor, Department of Human Ecology and Community Health, Kansas University Medical School.

Warren R. Guild, M.D.
Past president of the American College of Sports Medicine; clinical associate in medicine, Harvard Medical School.

Theodore G. Klumpp, M.D.
Medical Consultant to the President's Council on Physical Fitness and Sports.

Hans Kraus, M.D.
Clinical Associate professor of physical medicine and rehabilitation, New York University Medical School; co-developer of the Kraus-Weber tests for strength and flexibility.

Lawrence E. Lamb, M.D.
Former professor of medicine, Baylor Medical School; former chief of cardiology, Sheppard Air Force Base Hospital; syndicated medical columnist.

Allan J. Ryan, M.D.
Professor of physical education and rehabilitation medicine,
University of Wisconsin.

Extract from:

C. Carson Conrad, "Does Your Favorite Exercise Keep You Fit?"
Your Life and Health, February 1982, pp. 16-21.

APPENDIX 17a

A QUICK SCORECARD ON 14 SPORTS AND EXERCISES

Here's a summary of how the seven experts quoted in this article rated the various sports and exercises discussed. Ratings are on a scale of 0 to 3, thus a rating of 21 indicates maximum benefit (a score of 3 by all 7 panelists). Ratings were made on the basis of regular (minimum of 4 times per week), vigorous (duration of 30 minutes to one hour per session) participation in each activity.

		Jogging	Bicycling	Swimming	Skating (Ice or Roller)	Handball-Squash	Skiing-Nordic	Skiing-Alpine	Basketball	Tennis	Calisthenics	Walking	*Golf	Softball	Bowling
Physical Fitness	Cardiorespiratory endurance (stamina)	21	19	21	18	19	19	16	19	16	10	13	8	6	5
	Muscular endurance	20	18	20	17	18	19	18	17	16	13	14	8	8	5
	Muscular strength	17	16	14	15	15	15	15	15	14	16	11	9	7	5
	Flexibility	9	9	15	13	16	14	14	13	14	19	7	8	9	7
	Balance	17	18	12	20	17	16	21	16	16	15	8	8	7	6
General well-being	Weight control	21	20	15	17	19	17	15	19	16	12	13	6	7	5
	Muscle definition	14	15	14	14	11	12	14	13	13	18	11	6	5	5
	Digestion	13	12	13	11	13	12	9	10	12	11	11	7	8	7
	Sleep	16	15	16	15	12	15	12	12	11	12	14	6	7	6
	Total	148	142	140	140	140	139	134	134	128	126	102	66*	64	51

*Ratings for golf are based on the fact that many Americans use a golf cart and/or caddy. If you walk the links, the physical fitness value moves up appreciably. See comments of individual panelists

Extract from: C. Carson Conrad, "Does Your Favorite Exercise Keep you Fit?" Your Life and Health, February 1982, pp. 16-21.

APPENDIX 17b

A Brief Outline of Selected Participants
Aerobic Recreation Programmes

Sample 1: Male (19) 185 cm, (83 kg original weight)

This person originally spent approximately one hour per week in walking and in playing basketball. Nearly eight hours per week were occupied playing pool. After encouragement by his girlfriend he began jogging. At the end of four months, time originally spent at the pool table had now been utilized mainly in jogging (up to six hours per week). His basketball game improved considerably owing to increased endurance. In shedding 3.3 kg his new weight of 79.5 kg was approximately 2 kg from his ideal weight. A considerable amount of jogging was done with his girlfriend, around 40-50 minutes daily on bush tracks.

Sample 2: Male (28) 165 cm, (81 kg original weight)

Having been considerably over optimum weight (approximately 16 kg) this very solidly built person with some previous experience in squash commenced jogging on the beach with another male friend. His first outing took him 600 m jogging before having to walk. He was quite shocked at his impaired condition. This stimulated him to make a concerted effort to improve. He accepted short term personal goals and being encouraged by a small group of dedicated jogging friends managed to run four miles after three months having been involved in training sessions three times weekly. He noted a vast improvement in his squash. He further lost 4 kg, 12 kg away from optimum weight. His programme improved at the average rate of about half a mile per fortnight. He experienced surprisingly little or no muscle strain possibly due to his moderate increases in mileage.

Sample 3: Female (31), 160 cm (45 kg original weight)

Having done little previous aerobic exercise since her teenage years, with the exception of some cycling, her first week of aerobics consisted mainly of walk-jog sessions of about 400 metres. Each week a friend, an older woman who was a seasoned jogger, called and encouraged her out after darkness (approximately 8 pm), regularly. After six weeks she was able to run two blocks (2 km) and walk one block. Aproximately three hours were now being spent weekly in aerobic exercise. At this time a lower abdomen pain stopped her and in her opinion was due to probably attempting too much too soon. Her comment describes her dismay, "I have felt so lousy lately since not exercising in the above manner, everything has got out of proportion and has ended in depression yesterday." She commenced her programme six weeks later, but at a more moderate rate.

APPENDIX 18

Energy Expenditures in Different Sports

	Occupational	Recreational
1½-2 mets*	Desk work Auto driving Typing	Standing Walking (strolling 1 mile per hour) Playing cards
2-3 mets	Auto repair Radio, TV repair Janitorial work Typing, manual Bartending	Level walking (2 miles per hour) Level bicycling (5 miles per hour) Billiards, bowling Golf (power cart) Canoeing (2½ miles per hour) Horseback riding (walk)
3-4 mets	Brick laying, plastering Wheelbarrow (100-lb. load) Machine assembly Trailer-truck in traffic Welding (moderate load) Cleaning windows	Walking (3 miles per hour) Cycling (6 miles per hour) Horseshoe pitching Volleyball (6-man non-competitive) Golf (pulling bag cart) Archery Sailing (handling small boat) Horseback (sitting to trot) Badminton (social doubles)

*1 met = oxygen uptake of about 3.5 ml./kg./min. or approximately 1.1 kcal./min.; figures here include resting metabolic needs.

Reprinted from Fox, S.M., Naughton, J.P., and Gorman, P.A: Physical activity and cardiovascular health. III. The exercise prescription; frequency and type of activity. Mod Concepts Cardiovasc Dis 41:6, June 1972.

	Occupational	Recreational
4-5 mets	Painting, masonry Paperhanging Light carpentry	Walking (3½ miles per hour) Cycling (8 miles per hour) Table tennis Golf (carrying clubs) Dancing (foxtrot) Badminton (singles) Tennis (doubles) Many calisthenics
5-6 mets	Digging garden Shoveling light earth	Walking (4 m.p.h.) Cycling (10 m.p.h.) Canoeing (4 m.p.h.) Horseback (posting to trot) Ice or roller skating (9 m.p.h.)
6-7 mets	Shoveling 10 min. (10-lb. load)	Walking (5 m.p.h.) Cycling (11 m.p.h.) Badminton (competitive) Tennis (singles) Folk (square) dancing Light downhill skiing Ski touring (2½ m.p.h.; loose snow) Water skiing
7-8 mets	Digging ditches Carrying 80 lbs. Sawing hardwood	Jogging (5 m.p.h.) Cycling (12 m.p.h.) Horseback (gallop) Vigorous downhill skiing Basketball Mountain climbing Ice hockey Canoeing Touch football Paddleball

	Occupational	Recreational
8-9 mets	Shoveling 10 min. (14-lb. load)	Running (5½ m.p.h.) Cycling (13 m.p.h.) Ski touring (4 m.p.h.; loose snow) Squash racquets (social) Handball (social) Fencing Basketball (vigorous)
10-plus	Shoveling 10 min. (16-lb. load)	Running: 6 m.p.h. = 10 mets 7 m.p.h. = 11½ mets 8 m.p.h. = 13½ mets 9 m.p.h. = 15 mets 10 m.p.h. = 17 mets Ski touring (5-plus m.p.h.) Handball (competitive) Squash (competitive)

Extract from:

Hal Higdon, Fitness Over Forty (Mountain View, California: World Publications, 1977), pp. 82-84.

APPROXIMATE METABOLIC COST OF ACTIVITIES

The following list of the number of calories burned in different physical activities was prepared by Robert E. Johnson, M.D., and colleagues from the department of physiology and biophysics at the University of Illinois in August 1967. It was published in a booklet prepared by the American Medical Association entitled, BASIC BODYWORK ... FOR FITNESS AND HEALTH. Dr. Johnson's standards showed the gross energy expenditure in calories per hour by a 150-pound individual, and his standards represented a compromise between those proposed earlier by the British Medical Association (1950), Christensen (1953), and Wells, Balke and Van Fossen (1956). Where available he used actual measured values and otherwise made what he referred to as a "best guess."

Running (10 m.p.h.)	900	Badminton	350
Scull rowing (race)	840	Swimming (0.25 m.p.h.)	300
Cycling (13 m.p.h.)	660	Walking (3.75 m.p.h.)	300
Squash and handball	600	Rowing (2.5 m.p.h.)	300
Skiing (10 m.p.h.)	600	Fencing	300
Swimming (0.5 m.p.h.)	600	Lawn mowing (hand mower)	270
Hill climbing (100 feet/hour)	490	Bowling	270
Water Skiing	480	Lawn mowing (power mower)	250
Tennis	420	Golf	250
Wood chopping or sawing	400	Canoeing (2.5 m.p.h.)	230
Ice skating (10 m.p.h.)	400	Walking 2.5 m.p.h.)	210
Ditch digging (hand shovel)	400	Bicycling (5.5 m.p.h.)	210
Table tennis	360	Domestic work	180
Roller skating	350	Standing	140
Volleyball	350	Driving an automobile	120
Square Dancing	350	Sitting	100
Horseback Riding (trotting)	350	Lying down or sleeping	80

Extract from:

Hal Higdon, Fitness Over Forty (Mountain View, California: World Publications, 1977), pp. 148-9.

APPENDIX 19

AN OUTLINE OF THE PRESENTATION OF SIX SEMINAR PROGRAMMES RELATING TO AEROBIC RECREATION

Session 1: Introduction to the Concept of Wholistic Health

Session one examined the various views of the audience on the concept of the nature of health. Many of the forty-three persons attending expressed their views freely. Slides were shown on the death rate changes in Australia and the United States. Despite removing much of the mortal danger of infection and identifiable diseases since the commencement of the twentieth century, medical science has not been so successful in persuading people to examine their lifestyles. Most people in the Western world, including Australia, now choose their way to die. Lifestyles involving smoking, alcohol consumption, inadequate exercise, junk food and prolonged moderate or severe stress appeared to be the major factors causing death.

The heart is the hardest hit with these abuses. In the early 1970's 54.8% of deaths in the United States were caused by cardiovascular disease. Australia saw 52.2% of its population die of the same problem in 1975.

In discussing the causes of heart disease, exercise, diet and stress, were seen to be the major factors for Adventist concern. Although studies in California and New South Wales have shown Adventists to be considerably more healthy and less fragile in coping with life, the Seminar group still saw the need for considerable improvement in lifestyle. Methods of creating improved well-being were discussed. Again the major factors in creating more robust health and better psychological and spiritual well-being were seen to be more exercise, more unrefined foods, and the ability to cope with stress.

Further statistics demonstrated a decrease in heart disease in most western countries since the early 1970's. The reasons for this were also discussed and the audience generally agreed that apart from more sophisticated methods by doctors to keep people alive, there was a considerable upsurge in the awareness to care for our body. Health food shops and funruns had increased dramatically in the last ten years. In growing old, people need not become prematurely frail but could expect

robust health almost until death, provided they continued adequate exercise.

Finally the group was introduced to slides showing the brain as the organ often found to be least degenerate at death. The lungs were usually the most impaired followed closely by heart and kidneys. This knowledge helped the group to see that there was a considerable improvement in the physical being required to catch up with the effectiveness and efficiency of the brain.

Session 2: Relationships Between Mental and Physical Health

In this session, body-mind relationships were discussed. Thirty-five persons saw a series of slides demonstrating the power of the mind over the body. A definition of the ideal coping person was presented in the context of a Homeostatic state (Homoios--like, similar: stasis--position, standing). Homeostasis is the ability of living things to maintain the constancy of their internal milieu despite changes to the surrounding environment. Undesirable traits including flexibility of attitudes, and authoritarianism were discussed. The need for parent-child communication was highlighted and the discovery of activities that were qualitative. These could include interaction through recreation, e.g. bush walking, nature walks, and ball games, (contact sports excluded) that provided meaningful recreation together. Persons who did not foster relationships were often caught in a web of loneliness, despair and self-pity. This increased conditions of morbidity and decreased vital energy, a precurser to premature death. Challenges needed always to be kept before people. To meet these, physical and mental energy were essential.

Other factors relating to mental health were discussed. These included, a) diet (dealth with in Session 5), and b) stress. An inadequate diet created stresses and eventually distress to the physical and psychological being. Distress was defined as the inability to cope adequately with stress causing the eventual breakdown of emotional resources and other body functions.

Mental health was determined by such factors as sex, age, education, income and occupation.[1] While age and sex cannot be chosen the other listed factors involved choices along with other lifestyle aspects.

According to a mental health survey by Berkman (35 mm colour slides provided through The School of Health, Loma Linda

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[1] See Norman Bradburn, The Structure of Psychological Well-Being.

University), good mental health may be seen in people who

1. have a general feeling of being on top of the world
2. particularly excited or interested in some aspect
3. are pleased about having accomplished something

Poor mental health can develop in people who were:

1. either very lonely or isolated from other people
2. depressed or very unhappy for long periods of time
3. bored with life
4. too restless to remain seated
5. vaguely uneasy about something, and not knowing why

Session 3: Willpower and Physical Fitness

Session three attempted an examination of the principles of making the correct choice. These included:

1. Making a firm decision to change
2. Making a strong initial effort
3. Reinforcing that effort with honest satisfying motives
4. Declaring that choice to trusted friends
5. Rendering old habits incompatible with the new and better ones
6. Avoiding the old (negative) habit patterns wherever possible
7. Endeavouring to prevent any exceptions to your resolutions
8. Keeping your mind from dwelling on old negative habits
9. Being prepared for initial hard work in changing habits
10. Allowing the eight natural remedial principles to infiltrate your lifestyle and think of ways of creatively allowing this to occur

Eight health remedies were reviewed and discussed briefly. These principles included pure air (where possible), sunlight, temperance, adequate rest, systematic aerobic exercise, adequate diet, clean water, and trust in Divine power.

Vital energy is required to think positively and have the power to choose and carry out choices. In examining Berkman's mental-physical health relationships, values ranging from one to one hundred were given to various states of well-being. Lower scores indicated a more desirable psychological ability to cope with life. A person with a high energy level, i.e. good physical fitness, was rated at thirty-five, low to medium energy levels gave forty-six, one plus symptoms in the past year, fifty-two and a severe functional disability, sixty-three.

Aids to improved mental attitude included having a good hobby, e.g. an aerobics fitness programme for persons with sedentary of semi-sedentary work programmes. A discussion then ensued on the types of hobbies and leisure activities most enjoyable and beneficial to well-being. Thirty-five persons attended this meeting.

Session 4: The Effects of Aerobic Exercise

An indepth study on the effects of aerobic recreation was the prime theme of this session in which thirty-five persons were present. Various types of exercise presented on colour slides were discussed. These included aerobic, anerobic, isometric and isotonic forms.[1]

Rates of calorie expenditure were illustrated for various forms of work and recreation. An audience reaction was noted from the surprise revelation that endurance exercises such as running or jogging ranked as high as any other general forms of exercise. On the other hand, slow walking was among the least energetic, although its relaxation qualities cannot be denied.

As a guide to physical fitness for laymen, the Harvard Step test was suggested as an indication of cardiovascular fitness. This checking of pulse rates before and after three minutes of

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[1]Aerobic--the free use of oxygen as in prolonged exercise programmes.

Anerobic--fast spirits or short bursts of exercise involving power but not endurance. Blood flows more freely but only moderate amounts of oxygen utilized from external source.

Isotonic--muscle contraction to some extent; flow of blood is increased to some extent.

Isometric--muscles remain the same length, flow of blood reduced.

negotiating up and down a step of standardized height. The smaller the difference in pulse rate the greater the fitness of the individual.

Session 5: Testimonial; The Adequate Diet and the Control of Obesity

In this session, a guest speaker presented his testimony to the value of aerobic exercise. He described the transformation in his life through major weight loss, changes in diet, development of muscle tone, and mental and spiritual well-being. The seminar group (32) concentrated carefully on his presentation and were eager to ask questions relating to reasons for his change in lifestyle. This person (male, 31) had lost more than 30 kg over a period of three years. It had been originally suggested that he could be a candidate for a heart attack by forty. He had now extended his possible life-span to between 70 and 80 years of age. Having once been a bouncer for a night-club he had embarked on a career as a secondary school missionary teacher in New Guinea. The major causes for change, he stated, came from a constant vigil on refusing junk food, eating between meals and a heavy concentration on energetic recreative programmes. Apart from his conversion to Christianity and Adventism he believed aerobic exercise was the most significant area in which well-being was improved.

The second half of this session was devoted to the question of adequate diet when exercising, and the benefits of better control of obesity. The average Australian consumes energy at the rate of about 3500 calories daily. Many, however, need less than 3000 calories to maintain normal weight.

Exercise programmes tend to increase people's awareness of physical well-being and the need to monitor more carefully their food intake. Soft drinks, cream buns, and sweets are all part of the "empty calorie" cycle that add unwanted energy and kilograms of fleshy baggage to the body. Persons who are 20% overweight, have an increase in heart disease of between 43-51%, diabetes 83-133%, digestive system diseases 39-68%, and cerebral haemorrhage, 29-53%

Further comment was made on protein, carbohydrate and vitamin needs, the use of water and minerals in the diet. Statistics were also revealed concerning the correct amounts of sleep needed and the improvements that might be expected through recreative exercise.

Session 6: Challenge and Review:
Filling out of a Questionnaire

This session, in which 28 people attended, was designed to challenge people to improve where needed, their quality of exercise. A lifestyle questionnaire was filled out by these persons seeking to embark on an exercise programme. It was understood that another similar survey would be filled out some three to four months later. Discussion arose over the type of exercise that people wanted to engage in, and the quality of exercise that should be sought in order to obtain maximum benefits in well-being.

This last session of the seminar was concluded with a summary of the Scripture's concept of body in relationship to man's individual being and the Christian community.

APPENDIX 20

SURVEY

CONFIDENTIAL MA AC 81 MC

COMMUNITY LIFE STYLE PATTERNS

Please read the following instructions before commencing.

1. Please do not put your names on this survey form.
2. When answering the questions, be as accurate as possible to allow the best results.
3. It is hoped that your help in this survey will be of benefit toward the improvement of our lifestyle in the community.
4. Please be as frank as you wish as complete anonymity is guaranteed.
   Thank you for your time and interest.

1. What is your age in years? ☐

2. Sex? Male ☐ Female ☐

3. Height in centimetres? ☐

4. Weight in kilograms? ☐

5. Frame size? Small ☐ Medium ☐ Large ☐
   (Placing first finger and thumb around wrist, overlap=small, meet=average, don't meet=large.)

6. How many years have you been a Seventh-day Adventist? ☐

7. Do you attend services ie. Sabbath School and Church?

Always	Often	Sometimes	Rarely	Never
☐ 9	☐ 7	☐ 5	☐ 3	☐ 1

8. Do you attend other religious meetings in the Church?

Always	Often	Sometimes	Rarely	Never
9	7	5	3	1

9. Do you attend non-religious activities organised by the Church?

Always	Often	Sometimes	Rarely	Never
9	7	5	3	1

10. Do you find it easy to mix with people?

In Church	Out of Church	Prefer to remain alone
5	5	1

Both are easy	Neither are easy
9	1

11. Are you active in witnessing for Christ?

Always	Often	Sometimes	Rarely	Never
9	7	5	3	1

12. How real does Christ's presence seem to you?

Intimate	Very near	Close when needed	distant	unknown
9	8	7	3	1

13. How many hours sleep do you average per night?

0-3	4-6	6-8	8-10	over 10
1	5	9	5	1

14. What is your normal sleep pattern excluding attention to children?

Uninterrupted/ Deep	Uninterrupted/ Light	Few Interruptions/ Deep
9	7	7

Few interruptions/Light	Spasmodic
5	3

15. How quickly do you get to sleep? (Minutes)

1-5	5-15	15-30	30-60	60+
9	9	7	5	1

16. Do you take sleeping tablets?

Every Night	More than 3 times a week	Once a week	Once a month	Never
1	3	5	7	9

17. Do you have family commitments which affect your sleep pattern?

Always	Often	Sometimes	Seldom	Never

18. Are you satisfied with your usual amount of sleep?

Always	Often	Sometimes	Seldom	Never
9	7	5	3	1

19. How many meals do you eat each day, including morning tea etc.?

1	2	3	4	5 or more
1	9	9	5	3

20. After you first awake from sleep which is your largest meal?

1st	2nd	3rd	4th	5th
9	7	5	5	5

21. How often do you eat meat?

Never	once/month	once/week	several times/ week	daily
9	9	7	5	3

22. How much do you consider you eat per meal?

Much too little	Too little	Just right	Too much	Far too much
1	7	9	5	1

23. Do you skip breakfast?

Always	Often	Sometimes	Seldom	Never
1	3	5	7	9

24. Do you eat snack foods? eg. potato crisps, chocolate, cake, cordial, lollies, cream buns etc.

Every day	3 times/week	1 time/week	1 time/month	never
1	5	7	9	9

25. Do you enjoy your work?

Always	Often	Sometimes	Seldom	Never
9	7	5	3	1

26. Does your work cause you depression or anxiety?

Always	Often	Sometimes	Seldom	Never
1	3	5	7	9

27. Do you suffer from headaches? (Excluding those from monthly cycle)

Daily	About 3 times/week	Once/week	Once/month	Never
1	3	5	7	9

28. Are your headaches related to work stress?

Always	Often	Sometimes	Seldom	Never

29. Are your headaches related to your physical state?

Yes ☐ No ☐

30. Are your headaches related to your emotional state? ie. depression, anxiety, worry, etc.

Yes ☐ No ☐

31. Are you a happy person?

Always	Often	Sometimes	Seldom	Never
9	7	5	3	1

32. Do you become easily depressed and/or over stressed?

Always	Often	Sometimes	Seldom	Never
1	3	5	7	9

33. Is the intensity of that stress and/or depression

Intolerable	Severe	Moderate	Mild	Non-existant
1	3	5	7	9

34. Do you consider that you are able to cope with stress and/or depression?

Always	Often	Sometimes	Seldom	Never
9	7	5	3	1

35. How often are you involved in non-denominational community activity?

Always	Often	Sometimes	Seldom	Never
9	7	5	3	1

36. How well do you get on with people closely related to you?

Intimately	Communicate Well	Satisfactory	Strained	Don't Care
9	7	5	3	1

37. How many hours do you spend on leisure or recreational activities per week?

0-1	1-3	3-6	6-9	more than 9
1	3	5	7	9

38. How much of your recreation time is spent in physical exercise?

None	None to 25%	25% to 50%	50% to 75%	above 75%
1	3	5	7	9

39. How many hours do you spend per week in aerobic physical exercise?

0	0-1	1-3	3-7	more than 7
1	3	5	7	9

40. Do you enjoy your recreation?

Always	Often	Sometimes	Rarely	Never
9	7	5	3	1

41. Does your recreation engage you in sweating and/or deep breathing?

Always	Often	Sometimes	Rarely	Never
9	7	5	3	1

42. Does your recreation and/or leisure time aid your self confidence?

Always	Often	Sometimes	Rarely	Never
9	7	5	3	1

43. Does recreation and/or leisure time aid your relationship to others?

Always	Often	Sometimes	Rarely	Never
9	7	5	3	1

44. Does your recreation and/or leisure time aid your feeling of physical well-being?

Always	Often	Sometimes	Rarely	Never
9	7	5	3	1

45. Does your recreation and/or leisure time aid your ability to approach life's challenges?

Always	Often	Sometimes	Rarely	Never
9	7	5	3	1

46. Does your recreation and/or leisure time aid your general health?

Always	Often	Sometimes	Rarely	Never
9	7	5	3	1

47. Does your recreation and/or leisure time aid your development of character?

Always	Often	Sometimes	Rarely	Never
9	7	5	3	1

48. According to your height and build, do you think you are...?

Underweight	Just right	Overweight	Don't Know	Don't Care
7	9	5	3	3

49. Do you participate on a weekly basis or more in one of the following:

Walking		
Swimming		
Jogging		
Tennis		
Squash		
Cycling		

Hours per week

Other, please state:

_____ | |
_____ | |
_____ | |

50. If you have other leisure activities that do not involve physical activity, please state.

Reading		
Painting		
Sewing		
T.V.		

Other, please state:

_____	
_____	
_____	

NOTE: Questions 17 and 28-30 were not calculated because of inaccurate returns by respondents.

APPENDIX 21

SYDNEY MEDICHECK SAMPLES

The Sydney Medicheck samples containing a total of 37,678 adults (20,446 males and 17,232 females) studied certain psychosocial problems (Reynolds and Rizzo, Psychological Problems and Sydney Adults, p. 19). These included "stress, regular use of analgesics and psychotropic drugs, daily headaches, sleeping problems, emotional problems, depression and getting on poorly with other people." The survey further stated: "It is becoming increasingly acknowledged that psychosocial problems have an important effect on people's physical and mental health and their quality of life." (p. 19)

Because our survey is conducted on Seventh-day Adventists it was considered unnecessary to survey the participants on other aspects of the Medicheck Survey. These included alcohol consumption, and cigarette consumption. Other problems such as job dissatisfaction, marriage problems and sexual problems were not surveyed as this would have been too complex and time-consuming to examine.

Susceptibility to disease, according to Cheraskin and Ringsdorf, includes the prognostic parameters of weight, sleep, dietary habits, and physical fitness. (Predictive Medicine, p. 23.) When a person suffers from overweight, for instance, the following may be observed.

Weight

Independent of blood glucose, in this same group, the heavier individuals report more cancer (figure 1). Finally, the incidence of cancer is brought into sharper focus when viewed in terms of both weight and blood glucose (figure 2). Thus the limited evidence implies that both increased weight and elevated blood glucose levels may be viewed as cancer risk factors and used in the development of a cancer proneness profile.

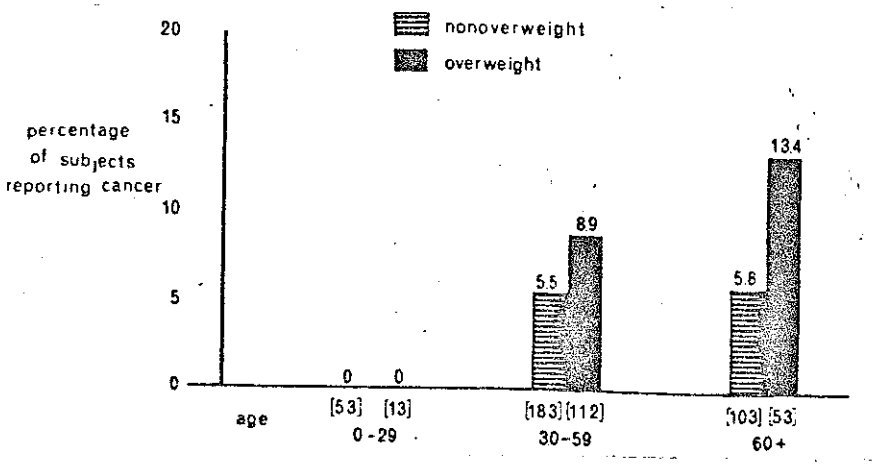


Figure 1

Figure 1. The relationship of age (on the horizontal axis) versus % of subjects reporting cancer (on the vertical axis) in terms of weight. The point emphasized is that, with advancing age, the frequency of reported cancer is progressively higher in the overweight group (black columns) irrespective of other factors. (Predictive Medicine, p. 18.)

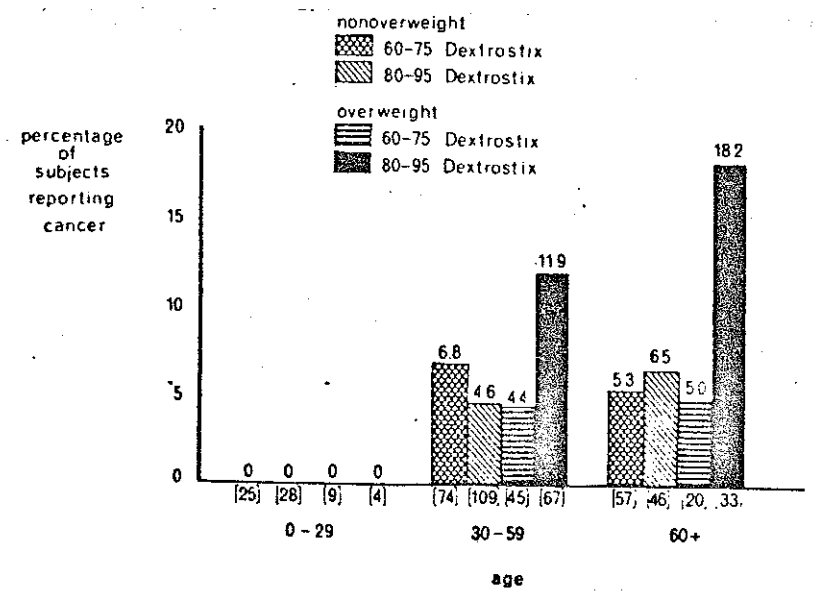


Figure 2

Figure 2. The relationship of age (on the horizontal axis) and percentage of subjects reporting cander (on the vertical axis) in terms of weight and blood glucose. The overweight subjects with the slightly elevated blood glucose (black columns) show the highest rate. (p. 19.)

Analgesic and Psychotropic Drug Use

According to Reynolds and Rizzo on the use of analgesics and psychotropic drugs: "In general, surveys have found that more females than males abuse analgesics, use is greatest in the lower socio-economic groups and use increases with age." (p.9) Such drugs are used to relieve anxiety, tension, and depression. Medicheck stated that nearly all people surveyed said that they would like to be free from their use but only if the problems causing their ingestion could be removed. (p. 12.)

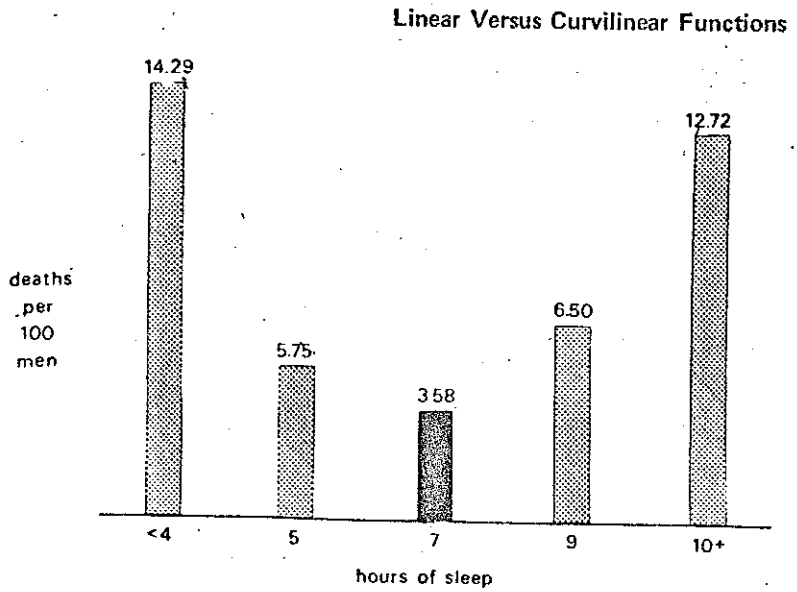
Sleep

There are a considerable number of men and women that usually do not sleep well, according to the Medicheck Survey, approximately twenty percent of men and thirty percent of women. (p.13.) This in turn causes many to feel either tense, tired or irritable or even worse, the following day.

Medicheck indicates that "sixty-eight percent of men and seventy-eight percent of women" who have sleeping problems "attributed it to tension, nerves, or an overactive mind." (p.13.) Once again few attributed their sleeping problems to physical causes. Rizzo and Reynolds further comment: "Sleeping problems apparently affect a sizeable proportion of the population. It appeared that stress reduction could alleviate many people's sleeping problems." (p.14.) One of the solutions advocated was a change of lifestyle.

Again in regard to sleep patterns and the hours of sleep obtained per night, Cheraskin and Ringsdorf state:

> "Mortality and the curvilinear concept are not restricted to biochemical findings. For example, in a study of 1,064,004 men and women, those who reported about seven hours of sleep per night had the lowest death rates. Those who reported more or less sleep had progressively higher death rates." (p.48.)



Hammond, E C Some preliminary findings on physical complaints from a prospective study of 1,064,004 men and women. Am J. Public Health 54. #1,11-23, January 1964

Figure 3

Figure 3. The curvilinear or parabolic relationship of mortality and hours of sleep per day depicting the optimal sleep time of seven hours.

Extract from:

Ingrid Reynolds and Cowcetta Rizzo, Psychological Problems and Sydney Adults, (Sydney: Adept Printing Pty. Ltd., 1979).

E. Cheraskin and W. M. Ringsdorf, Predictive Medicine, (Mountain View, California: Pacific Press, 1973).

APPENDIX 22

PHYSICAL ACTIVITY AND CLINICAL STATE

An increasing number of published reports deal with the utility of physical activity as it relates to mortality and to particular disease syndromes (e.g., ischemic heart disease, hypertension, and diabetes mellitus). For example, in a two year follow-up, men in every five-year age bracket between 45 and 84 years demonstrated an inverse relationship between exercise and mortality. A progressively lower death rate was observed as the degree of exercise increased. Figure 1 illustrates this association in 50-54 year-old men in four exercise groups. (Cheraskin and Ringsdorf, p. 103.)

However, there is only limited evidence to show the predictive value of exercise in terms of <u>early</u> clinical symptoms and signs. Figure 2 demonstrates the relationship of age (on the abscissa) versus clinical symptoms and signs as judged from the Cornell Medical Index Health Questionnaire (on the ordinate) in terms of daily exercise. Viewing figure 2 grossly, it is clear that the frequency of pathologic responses is significantly higher in both the younger and the older groups characterized by no daily exercise (black columns). Also, the difference in symptoms and signs in the older group is even more sharply defined in terms of daily physical activity. In other words, the progress of chronic disease appears to be considerably slowed in those who stay physically fit.

The relationship of physical activity and psychologic state has already been considered (Chapter 3). It should be recalled that the number of psychologic findings in 208 dentists and their wives was 33 percent greater for the 126 persons who did not take daily exercise (figure3-1, p. 28.)

Although many more examples could be cited, these simple observations are reasonable evidence of the predictive and preventive relationship of physical activity to the early clinical picture.

Physical Activity and Electrocardiography

It is generally agreed that, with advancing age, the height of the T wave in Lead 1 decreases. To some, this is regarded as one measure of physiologic aging; to others this

suggests pathosis. In support of the latter, there is reasonable evidence that, in certain cardiac disorders, the T wave is depressed.

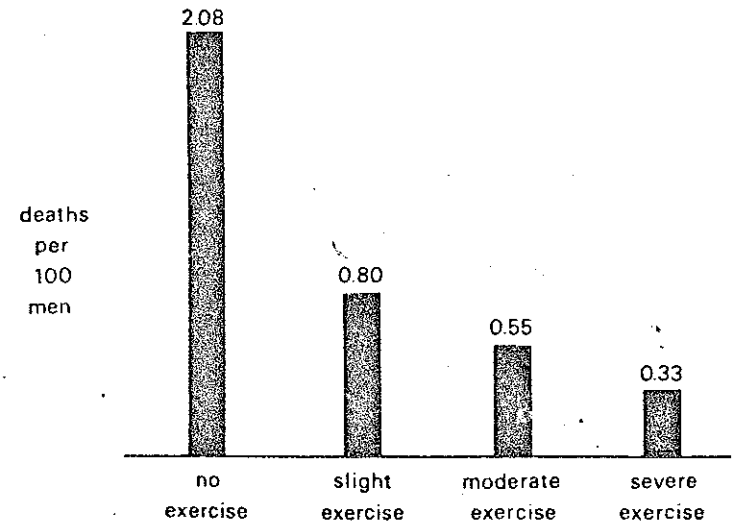
The question at hand is whether there is any relationship between physical activity and the height of the T wave in presumably healthy subjects. Figure 3 pictorially portrays age on the horizontal axis and the mean height of T, on the vertical axis in terms of daily exercise. The evidence suggests that, particularly in the older age category ($t=2.052$, $P<0.05$), there is a significant difference in the height of the T wave in those who report daily exercise versus those who do not. Specifically, the T wave is lower (more pathologic) in those without exercise (black column). For the physically fit in both age categories, the mean height of T, was the same.

This simple demonstration, supported by many others, suggests that physical activity and various electrocardiographic parameters are related.

Physical Activity and Biochemical State

Increasing information indicates that blood glucose and serum cholesterol levels can be altered with physical activity. Although uric acid is in an area not usually considered, figure 4 shows the relationship between daily exercise and nonfasting serum uric acid levels. The evidence suggests that, in a relatively older age sample, the serum uric acid level is significantly higher ($t=3.456$, $P<0.005$) in subjects who do not carry on daily exercise. As noted for the CMI complaints (figure 2), there is little change with age in those who remain physically fit.

This demonstration, supported by others, suggests that a significant predictive-preventive relationship exists between physical activity and biochemical state.



Hammond, E.C. Some preliminary findings on physical complaints from a prospective study of 1,064,004 men and women. Am. J. Public Health 54: #1, 11-23, January 1964.

Figure 1. The relationship between physical activity and mortality in 50-54 year-old men is an inverse one. The greater the exercise the less was the mortality in a two-year follow-up. (Fig. 10-1, p. 103.)

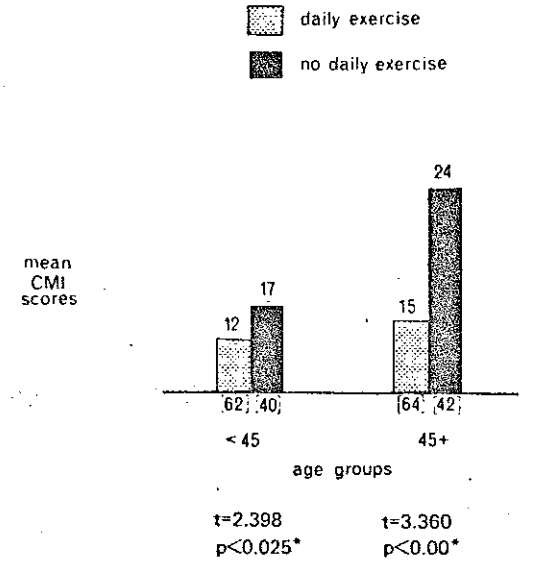


Figure 2. The relationship of age (on the abscissa) and clinical symptoms and signs as judged by CMI scores (on the ordinate) in terms of daily exercise. The groups, especially those in the older age category (45+ years), with no daily exercise, show more clinical findings in the black columns (Fig. 10-2, p. 104).

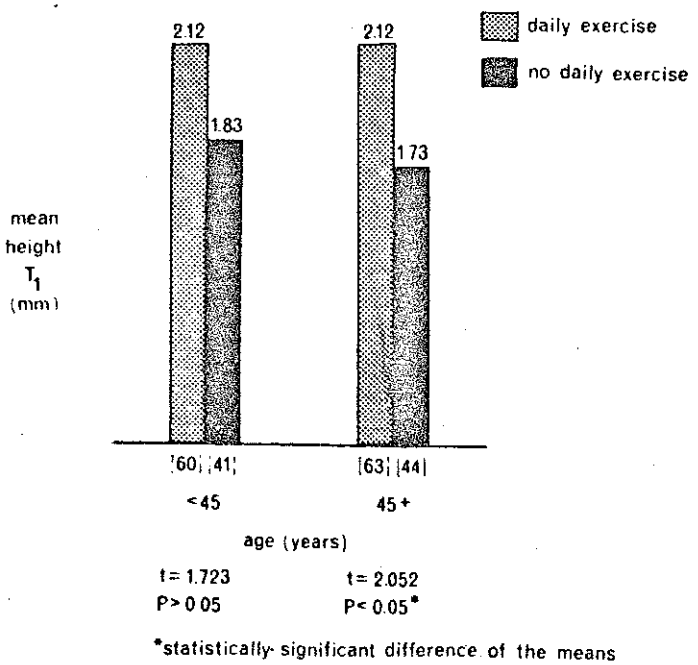


Figure 3. The relationship of age (on the x-axis) and mean height T_1 (on the ordinate) in terms of daily exercise. Those with daily exercise, and especially in the older age group (45+ years), show higher T_1 amplitude in the stippled columns (Fig. 10-3, p. 105).

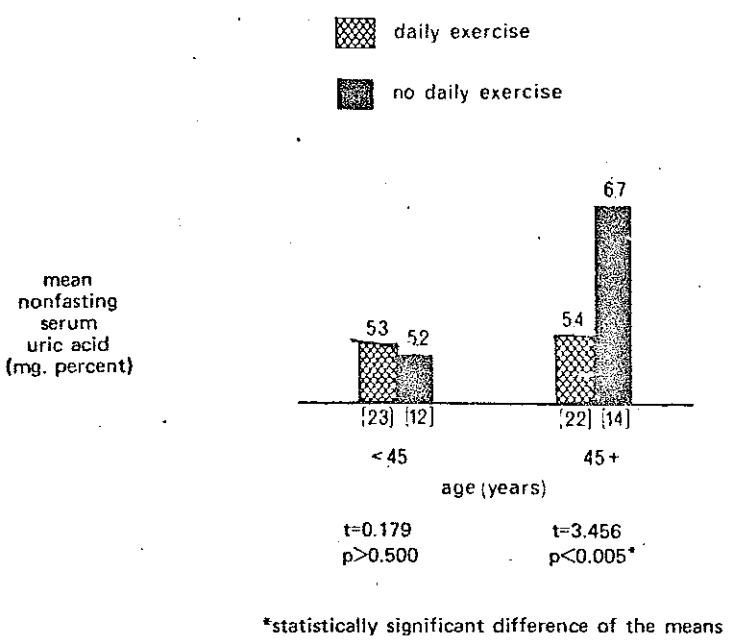


Figure 4. The relationship of age (on the horizontal axis) and serum uric acid scores (on the vertical axis). In the older group (45+ years), the group without daily exercise shows a statistically significantly higher mean nonfasting serum uric acid level in the black column (Fig. 10-4, p. 107).

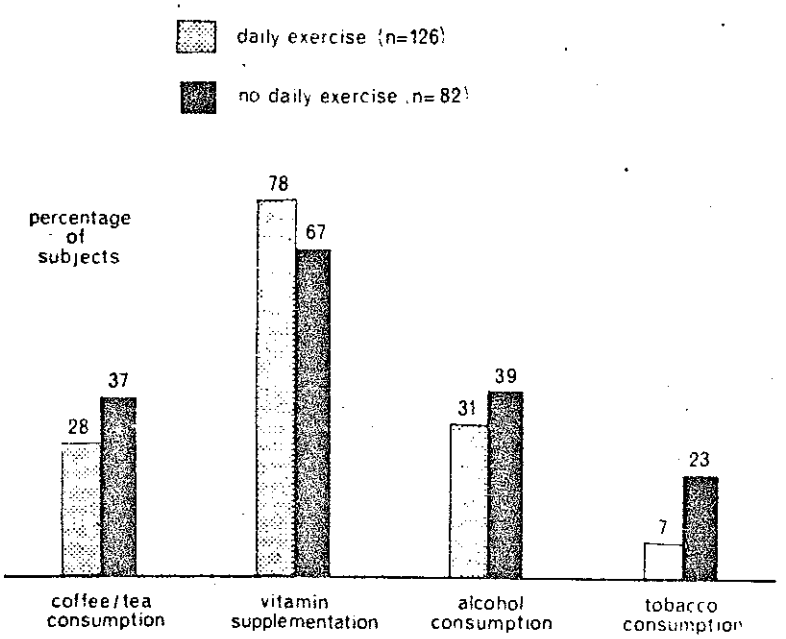


Figure 5. The interplay of exercise and other factors. It is noteworthy that subjects who exercise (stippled columns) tend to consume less coffee/tea, alcohol, tobacco and more frequently take vitamin supplements (Fig. 10-5, p. 108).

Physical Activity and Other Variables

Generally speaking, those who exercise are interested in the maintenance of health. Hence, it is interesting to observe other habits in subjects who perform daily exercise versus those who do not. Figure 5 is an analysis of the interplay of exercise and coffee/tea, alcohol, tobacco consumption, and vitamin supplementation. The data suggests fewer people who carry out daily exercise drink coffee, tea, and alcohol. Most importantly, these individuals as a group consume much less tobacco. As a matter of fact, the number of nonexercising smokers is over threefold (23 to 7 percent) that observed in individuals who carry on daily physical activity. Finally, figure 5 shows that the frequency of vitamin supplementation is also greater in exercise groups.

Earlier mention (Chapter 3) has been made of factors which may be regarded as susceptibility versus resistance agents. Later, in chapter 9, it was established that certain dietary nutrients discourage the development of disease. Hence, they may be defined as resistance agents. Other dietary elements were noted to encourage disease. Accordingly, they may be viewed as susceptibility agents. The observations made in this report suggest that physical activity may be considered as a resistance factor. In other words, the addition of physical activity discourages disease; the absence of exercise invites disease.

The cardinal point to be made is that awareness of physical activity as it relates to the genesis of disease is a unique feature of a predictive medicine program.

Extracts from:

E. Cheraskin and W. M. Ringsdorf, Jr. Predictive Medicine: A Study in Strategy (Mountain View, California: Pacific Press Publishing Association, 1974), pp. 101-109.

APPENDIX 22

Page 12 MICHAEL CHAMBERLAIN LIFE-STYLE SURVEY 1982

VARIABLE NO.	NAME	TOTAL FREQUENCY	MEAN	STANDARD DEVIATION	ST. ERR OF MEAN	COEFF. OF VARIATION	SMALLEST VALUE	SMALLEST Z-SCORE	LARGEST VALUE	LARGEST Z-SCORE	RANGE
1	run	40	1.500	0.506	0.0801	0.33758	1.000	-0.99	2.000	0.99	1.000
3	age	40	28.025	7.989	1.2631	0.28506	16.000	-1.51	44.000	2.00	28.000
4	sex	40	0.400	0.496	0.0784	1.24035	0.000	-0.81	1.000	1.21	1.000
5	height	40	172.150	8.746	1.3828	0.05080	157.000	-1.73	188.000	1.81	31.000
6	weight	40	67.750	9.596	1.5173	0.14164	45.000	-2.37	85.000	1.80	40.000
7	frame	40	1.925	0.616	0.0973	0.31974	1.000	-1.50	3.000	1.75	2.000
8	sdayrs	40	15.075	11.364	1.7969	0.75385	0.000	-1.33	41.000	2.28	41.000
9	optwt	40	64.075	8.983	1.4203	0.14019	50.000	-1.57	83.000	2.11	33.000
10	cr7	40	8.300	1.539	0.2434	0.18545	1.000	-4.74	9.000	0.45	8.000
11	cr8	40	5.750	1.850	0.2925	0.32177	1.000	-2.57	9.000	1.76	8.000
12	cr9	40	5.350	1.626	0.2571	0.30391	1.000	-2.68	7.000	1.01	6.000
13	cr10	40	7.350	3.101	0.4904	0.42194	1.000	-2.05	9.000	0.53	8.000
14	cr11	40	5.050	1.999	0.3161	0.39591	1.000	-2.03	9.000	1.98	8.000
15	cr12	40	6.700	1.990	0.3146	0.29697	1.000	-2.86	9.000	1.16	8.000
16	s113	40	7.450	2.099	0.3320	0.28181	1.000	-3.07	9.000	0.74	8.000
17	s114	40	7.350	1.805	0.2854	0.24561	3.000	-2.41	9.000	0.91	6.000
18	s115	40	7.875	1.990	0.3146	0.25264	1.000	-3.46	9.000	0.57	8.000
19	s116	40	8.600	0.810	0.1281	0.09421	7.000	-1.97	9.000	0.49	2.000
20	s118	40	6.575	1.767	0.2794	0.26875	1.000	-3.15	9.000	1.37	8.000
21	di19	40	8.200	1.856	0.2935	0.22639	1.000	-3.88	9.000	0.43	8.000
22	di20	40	6.525	1.664	0.2631	0.25501	5.000	-0.92	9.000	1.49	4.000
23	di21	40	8.625	1.148	0.1815	0.13307	3.000	-4.90	9.000	0.33	6.000
24	di22	40	6.725	2.342	0.3704	0.34830	1.000	-2.44	9.000	0.97	8.000
25	di23	40	6.875	2.127	0.3362	0.30932	1.000	-2.76	9.000	1.00	8.000
26	di24	40	6.850	2.455	0.3882	0.35843	1.000	-2.38	9.000	0.88	8.000
27	wo25	40	6.775	1.915	0.3027	0.28261	3.000	-1.97	9.000	1.16	6.000
28	wo26	40	5.800	1.911	0.3021	0.32945	1.000	-2.51	9.000	1.67	8.000

VARIABLE NO.	NAME	TOTAL FREQUENCY	MEAN	STANDARD DEVIATION	ST. ERR OF MEAN	COEFF. OF VARIATION	S M A L L E S T VALUE	Z-SCORE	L A R G E S T VALUE	Z-SCORE	RANGE
29	hd27	40	8.150	1.578	0.2495	0.19361	3.000	-3.26	9.000	0.54	6.000
30	em31	40	7.025	1.025	0.1621	0.14591	5.000	-1.98	9.000	1.93	4.000
31	em32	40	5.975	1.702	0.2691	0.28485	1.000	-2.92	9.000	1.78	8.000
32	em33	40	5.925	1.655	0.2616	0.27926	3.000	-1.77	9.000	1.86	6.000
33	em34	40	7.225	1.561	0.2467	0.21599	3.000	-2.71	9.000	1.14	6.000
34	co35	40	3.850	1.805	0.2854	0.46890	1.000	-1.58	9.000	2.85	8.000
35	co36	40	6.725	1.648	0.2606	0.24512	3.000	-2.26	9.000	1.38	6.000
36	g37	40	5.850	2.860	0.4523	0.48896	1.000	-1.70	9.000	1.10	8.000
37	ar38	40	4.400	2.610	0.4126	0.59310	1.000	-1.30	9.000	1.76	8.000
38	ar39	40	4.000	2.641	0.4176	0.66023	1.000	-1.14	9.000	1.89	8.000
39	qr40	40	7.225	2.106	0.3330	0.29149	1.000	-2.96	9.000	0.84	8.000
40	qr41	40	5.250	2.871	0.4540	0.54689	1.000	-1.48	9.000	1.31	8.000
41	qr42	40	6.150	2.476	0.3915	0.40261	1.000	-2.08	9.000	1.15	8.000
42	qr43	40	6.350	2.237	0.3536	0.35223	1.000	-2.39	9.000	1.18	8.000
43	qr44	40	6.200	2.633	0.4163	0.42470	1.000	-1.97	9.000	1.06	8.000
44	qr45	40	6.325	2.325	0.3676	0.36755	1.000	-2.29	9.000	1.15	8.000
45	qr46	40	6.300	2.662	0.4209	0.42257	1.000	-1.99	9.000	1.01	8.000
46	qr47	40	5.975	2.304	0.3642	0.38556	1.000	-2.16	9.000	1.31	8.000
47	g48	40	6.925	1.873	0.2961	0.27043	4.000	-1.56	9.000	1.11	5.000
48	ar49	40	2.715	2.302	0.3640	0.84801	0.000	-1.18	9.000	2.73	9.000
49	sda%	40	55.252	39.718	6.2799	0.71884	0.000	-1.39	100.000	1.13	100.000
50	chrel	40	6.417	1.390	0.2198	0.21660	2.667	-2.70	8.000	1.14	5.333
51	sleep	40	7.570	1.016	0.1607	0.13426	5.400	-2.14	9.000	1.41	3.600
52	diet	40	7.300	1.270	0.2008	0.17397	2.333	-3.91	9.000	1.34	6.667
53	work	40	6.287	1.709	0.2703	0.27185	3.000	-1.92	9.000	1.59	6.000
54	hdache	40	8.150	1.578	0.2495	0.19361	3.000	-3.26	9.000	0.54	6.000

APPENDIX 23

TABLE 1. Desirable Weights for Men and Women According to Height and Frame, Ages 25 and Over*

Height (In Shoes)†	Weight in Pounds (In Indoor Clothing)		
	Small Frame	*Medium Frame*	*Large Frame*
	Men		
5 ft 2 in	112–120	118–129	126–141
5 ft 3 in	115–123	121–133	129–144
5 ft 4 in	118–126	124–136	132–148
5 ft 5 in	121–129	127–139	135–152
5 ft 6 in	124–133	130–143	138–156
5 ft 7 in	128–137	134–147	142–161
5 ft 8 in	132–141	138–152	147–166
5 ft 9 in	136–145	142–156	151–170
5 ft 10 in	140–150	146–160	155–174
5 ft 11 in	144–154	150–165	159–179
6 ft 0 in	148–158	154–170	164–184
6 ft 1 in	152–162	158–175	168–189
6 ft 2 in	156–167	162–180	173–194
6 ft 3 in	160–171	167–185	177–199
6 ft 4 in	164–175	172–190	182–204
	Women		
4 ft 10 in	92–98	96–107	104–119
4 ft 11 in	94–101	98–110	106–122
5 ft 0 in	96–104	101–113	109–124
5 ft 1 in	99–107	104–116	112–128
5 ft 2 in	102–110	107–119	115–131
5 ft 3 in	105–113	110–122	118–134
5 ft 4 in	108–116	113–126	121–138
5 ft 5 in	111–119	116–130	125–142
5 ft 6 in	114–123	120–135	129–146
5 ft 7 in	118–127	124–139	133–150
5 ft 8 in	122–131	128–143	137–154
5 ft 9 in	126–135	132–147	141–158
5 ft 10 in	130–140	136–151	145–163
5 ft 11 in	134–144	140–155	149–168
6 ft 0 in	138–148	144–159	153–174

*Prepared by the Metropolitan Life Insurance Company. Derived primarily from data of the Build and Blood Pressure Study, 1959.
†1 inch heels for men and 2 inch heels for women.

Extract from:

Paul B. Beeson and Walsh McDermott, Textbook of Medicine (Fourteenth ed.) (Philadelphia: W. B. Saunders Company, 1975), p. 1379.

APPENDIX 24

CORRELATION MATRIX

(Data before and after averaging both results)

		chrel 50	sleep 51	diet 52	work 53	hdache 54	emotion 55	communty 56	aerobic 57	exqual 58	wtratio 59
chrel	50	1.0000									
sleep	51	0.3128	1.0000								
diet	52	0.6614	0.2998	1.0000							
work	53	0.4709	0.4996	0.4347	1.0000						
hdache	54	0.1052	0.0285	0.4270	0.0787	1.0000					
emotion	55	0.2711	0.3945	0.0459	0.6469[4]	-0.0162	1.0000				
communty	56	0.3074	0.2677	-0.0174	0.3837	-0.2201	0.5609[5]	1.0000			
aerobic	57	0.5320	0.2767	0.4526	0.3521	0.1568	0.2851	0.3412	1.0000		
exqual	58	0.6483[1]	0.3452	0.5030[2]	0.4225	0.1156	0.4148	0.4761	0.7839	1.0000	
wtratio	59	-0.4443	-0.0456	-0.6155[3]	-0.2745	-0.2480	-0.0535	-0.0303	-0.3696	-0.3583	1.0000
g37	36	0.3085	0.2877	-0.0344	0.3668	-0.1994	0.3112	0.5657[6]	0.5596	0.4915	0.0586
g48	47	0.3752	0.0823	0.4553	0.3193	-0.1436	0.1264	0.0171	0.1778	0.2916	-0.4760[7]

CORRELATION MATRIX AFTER EXERCISE

		chrel 50	sleep 51	diet 52	work 53	hdache 54	emotion 55	community 56	aerobic 57	exqual 58	wtratio 59
chrel	50	1.0000									
sleep	51	0.1914	1.0000								
diet	52	0.5526	0.2826	1.0000							
work	53	0.3788	0.3144	0.4041	1.0000						
hdache	54	0.0815	-0.0825	0.2995	-0.1212	1.0000					
emotion	55	0.2921	0.2024	-0.1928	0.4689	-0.1481	1.0000				
communty	56	0.3484	0.2089	0.1476	0.4093	-0.0839	0.4441	1.0000			
aerobic	57	0.3792	0.0905	0.3291	0.1584	0.1069	0.0312	0.3028	1.0000		
exqual	58	0.5661	0.2796	0.4134	0.2461	0.0410	0.1256	0.3951	0.7117	1.0000	
wtratio	59	-0.4176	0.1262	-0.4940	-0.1242	-0.2074	0.1471	-0.2304	-0.2016	-0.1132	1.0000
s37	36	0.2766	0.2340	0.2050	0.1765	-0.0081	0.0322	0.4335	0.6767	0.6465	0.0752
s48	47	0.3403	-0.0398	0.3160	-0.3650	-0.1043	0.1451	0.2799	-0.2020	0.1471	-0.3255

CORRELATION MATRIX BEFORE EXERCISE

		chrel 50	sleep 51	diet 52	work 53	hdache 54	emotion 55	communty 56	aerobic 57	exqual 58	wtratio 59
chrel	50	1.0000									
sleep	51	0.3603	1.0000								
diet	52	0.7102	0.2140	1.0000							
work	53	0.5017	0.6031	0.4107	1.0000						
hdache	54	0.0910	0.0419	0.4646	0.1440	1.0000					
emotion	55	0.2207	0.4692	0.0674	0.7199	0.0003	1.0000				
commnty	56	0.2563	0.2768	-0.1980	0.3483	-0.3413	0.6294	1.0000			
aerobic	57	0.7546	0.2724	0.4446	0.5025	0.1194	0.3901	0.3682	1.0000		
exqual	58	0.7004	0.2620	0.4497	0.4653	0.0796	0.4744	0.5269	0.8345	1.0000	
wtratio	59	-0.4435	-0.1222	-0.6855	-0.3474	-0.2540	-0.1297	0.1815	-0.5381	-0.4675	1.0000
s37	36	0.2911	0.2474	-0.3167	0.4010	-0.3762	0.4306	0.6582	0.3742	0.3330	0.1182
s48	47	0.3562	0.0029	0.4505	0.2250	-0.2761	-0.0170	-0.3103	0.2281	0.1746	-0.5723

95% .444 99% .561 99.9% .679 98% .516 99.5% .602

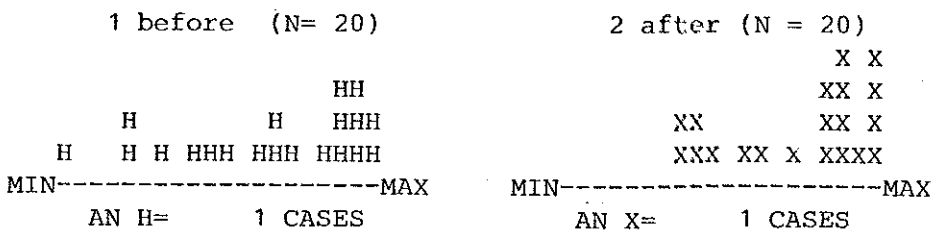
APPENDIX 25

DIFFERENCES ON SINGLE VARIABLES

chrel* VARIABLE NUMBER 50

STATISTICS	P-VALUE	DF
T (SEPARATE)	-0.95	0.3501 35.8
T (POOLED)	-0.95	0.3497 38

GROUP	1 before	2 after
MEAN	6.2083	6.6250
STD DEV	1.5540	1.2078
S.E.M.	0.3475	0.2701
SAMPLE SIZE	20	20
MAXIMUM	8.0000	8.0000
MINIMUM	2.6667	4.6667

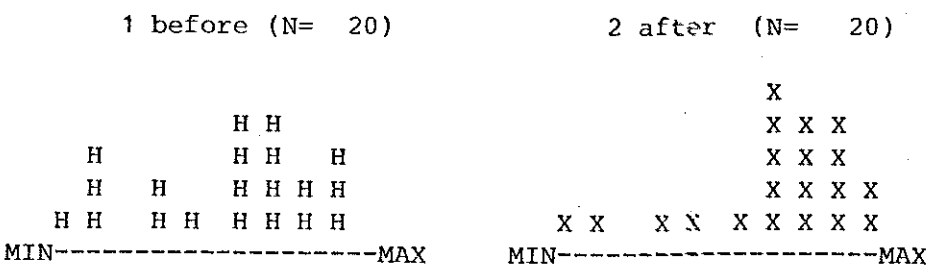


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sleep VARIABLE NUMBER 51

STATISTICS	P-VALUE	DF
T(SEPARATE)	-1.72	0.0932 38.0
T(POOLED)	-1.72	0.0932 38

GROUP	1 before	2 after
MEAN	7.3000	7.8400
STD DEV	1.0042	0.9789
S.E.M.	0.2245	0.2189
SAMPLE SIZE	20	20
MAXIMUM	8.6000	9.0000
MINIMUM	5.4000	5.4000



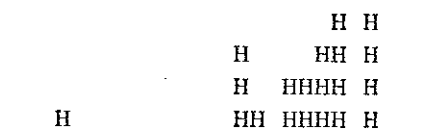
*Church relationships and spiritual awareness

diet VARIABLE NUMBER 52

STATISTICS		P-VALUE	DF
T (SEPARATE)	-1.88	0.0678	34.8
T (POOLED)	-1.88	0.0671	38

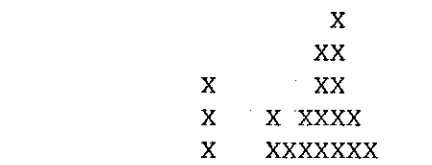
GROUP	1 before	2 after
MEAN	6.9333	7.6667
STD DEV	1.4043	1.0274
S.E.M.	0.3140	0.2297
SAMPLE SIZE	20	20
MAXIMUM	8.3333	9.0000
MINIMUM	2.3333	5.5000

1 before (N=20)



AN H = 1 CASES

2 after (N=20)



AN X = 1 CASES

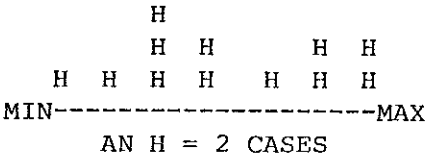
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work VARIABLE NUMBER 53

STATISTICS		P-VALUE	DF
T (SEPARATE)	-1.07	0.2939	34.8
T (POOLED)	-1.07	0.2933	38

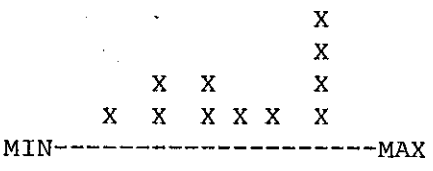
GROUP	1 before	2 after
MEAN	6.0000	6.5750
STD DEV	1.9467	1.4260
S.E.M.	0.4353	0.3189
SAMPLE SIZE	20	20
MAXIMUM	9.0000	8.0000
MINIMUM	3.0000	4.0000

1 before (N=20)



AN H = 2 CASES

2 after (N=20)



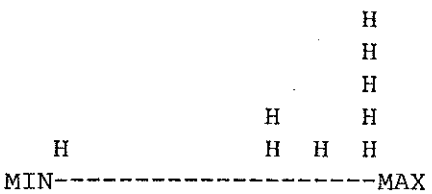
AN X = 2 CASES

hdache* VARIABLE NUMBER 54

STATISTICS		P-VALUE	DF
T (SEPARATE)	-0.80	0.4307	32.7
T (POOLED)	-0.80	0.4299	38

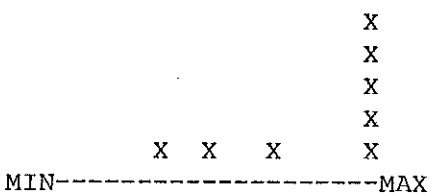
GROUP	1 before	2 after
MEAN	7.9500	8.3500
STD DEV	1.8771	1.2258
S.E.M.	0.4197	0.2741
SAMPLE SIZE	20	20
MAXIMUM	9.0000	9.0000
MINIMUM	3.0000	5.0000

1 before (N=20)



AN H = 3 CASES

2 after (N=20)



AN X = 3 CASES

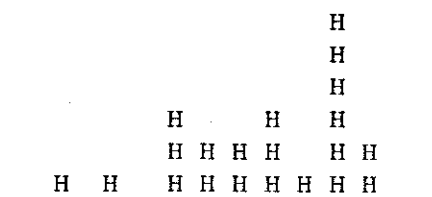
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emotion VARIABLE NUMBER 55

STATISTICS		P-VALUE	DF
T (SEPARATE)	-1.43	0.1611	34.4
T (POOLED)	-1.43	0.1603	38

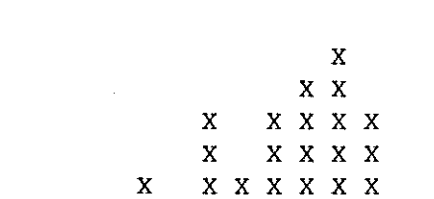
GROUP	1 before	2 after
MEAN	6.2625	6.8125
STD DEV	1.3990	0.9963
S.E.M.	0.3128	0.2228
SAMPLE SIZE	20	20
MAXIMUM	8.2500	8.2500
MINIMUM	3.0000	4.5000

1 before (N=20)



AN H = 1 CASE

2 after (N=20)



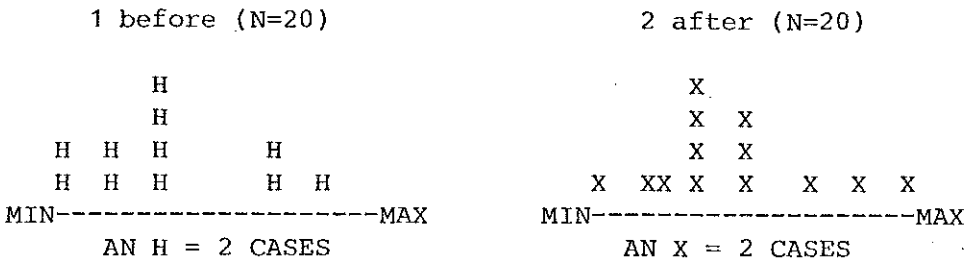
AN X = 1 CASE

*Headache

community VARIABLE NUMBER 56

STATISTICS		P-VALUE	DF
T (SEPARATE)	-0.79	0.4342	37.8
T (POOLED)	-0.79	0.4342	38

GROUP	1 before	2 after
MEAN	5.1000	5.4750
STD DEV	1.5526	1.4462
S.E.M.	0.3472	0.3234
SAMPLE SIZE	20	20
MAXIMUM	8.0000	9.0000
MINIMUM	3.0000	3.0000

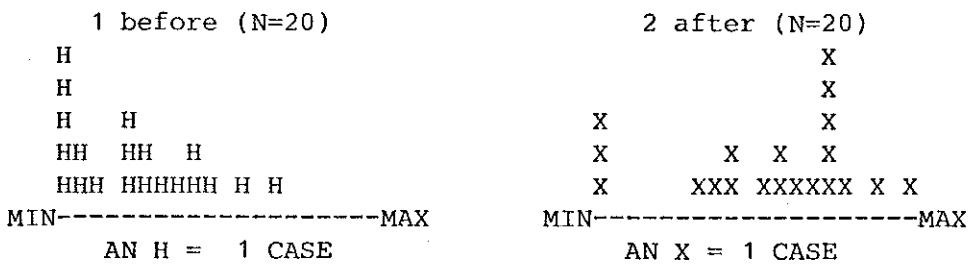


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aerobic VARIABLE NUMBER 57

STATISTICS		P-VALUE	DF
T (SEPARATE)	-3.79	0.0006	34.6
T (POOLED)	-3.79	0.0005	38

GROUP	1 before	2 after
MEAN	2.5517	4.8583
STD DEV	1.5927	2.2053
S.E.M.	0.3561	0.4931
SAMPLE SIZE	20	20
MAXIMUM	5.8333	8.5000
MINIMUM	0.6667	0.6667



exqual* VARIABLE NUMBER 58

STATISTICS		P-VALUE	DF
T (SEPARATE)	-2.91	0.0065	33.3
T (POOLED)	-2.91	0.0061	38

GROUP	1 before	2 after
MEAN	5.3313	7.1125
STD DEV	2.2734	1.5309
S.E.M.	0.5083	0.3423
SAMPLE SIZE	20	20
MAXIMUM	8.7500	8.7500
MINIMUM	1.0000	3.0000

1 before (N=20)

```
   H HH HHHHH HHHH H HH
MIN--------------------MAX
      AN H = 2 CASES
```

2 after (N=20)

```
                  X
                  X
                  X  X
      XX      X XXX XX
MIN--------------------MAX
      AN X = 2 CASES
```

---

wtratio** VARIABLE NUMBER 59

STATISTICS		P-VALUE	DF
T (SEPARATE)	0.98	0.3335	37.8
T (POOLED)	0.98	0.3334	38

GROUP	1 before	2 after
MEAN	7.7829	4.5656
STD DEV	10.7138	10.0459
S.E.M.	2.3957	2.2463
SAMPLE SIZE	20	20
MAXIMUM	26.8657	21.5686
MINIMUM	-10.0000	-12.0482

1 before (N=20)

```
     H       H
     H       H       H
   H HHHHHH HHHHHHH  H
MIN--------------------MAX
      AN H = 1 CASE
```

2 after (N=20)

```
          X
   X X X    XX  XX
   X X X X XXXXXXX  X
MIN--------------------MAX
      AN X = 1 CASE
```

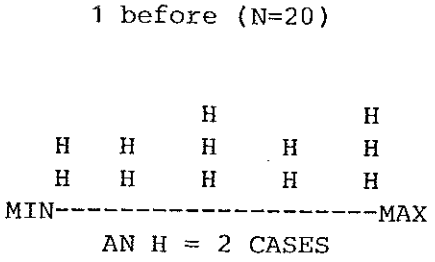
* Quality of exercise, eg. enjoyable, relaxing et cetera

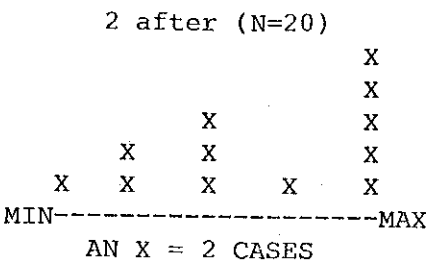
** Weight ratio

g37* VARIABLE NUMBER 36

STATISTICS		P-VALUE	DF
T (SEPARATE)	-1.46	0.1532	37.6
T (POOLED)	-1.46	0.1531	38

GROUP	1 before	2 after
MEAN	5.2000	6.5000
STD DEV	2.9665	2.6656
S.E.M.	0.6633	0.5960
SAMPLE SIZE	20	20
MAXIMUM	9.0000	9.0000
MINIMUM	1.0000	1.0000



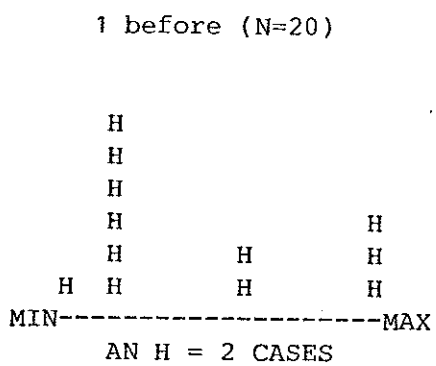


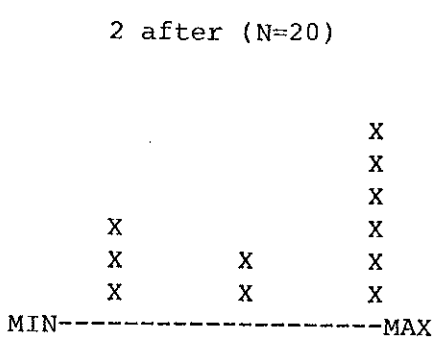
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g48** VARIABLE NUMBER 47

STATISTICS		P-VALUE	DF
T (SEPARATE)	-2.42	0.0206	37.9
T (POOLED)	-2.42	0.0206	38

GROUP	1 before	2 after
MEAN	6.2500	7.6000
STD DEV	1.8028	1.7290
S.E.M.	0.4031	0.3866
SAMPLE SIZE	20	20
MAXIMUM	9.0000	9.0000
MINIMUM	4.0000	5.0000





* Perceived weight

** Estimated expended energy in aerobic program

APPENDIX 26

CASE HISTORIES 3 AND 4

Male Student (19)

Over the last three months my exercise programme has been rewarding for me. I have been able to cope with a very heavy academic programme, largely I feel because of the exercise. The exercise, though occupying a large amount of time, has not hindered, but helped the "mental" side of my life.

Exercise programming has helped me gain self-confidence personally (i.e., in my perception of my abilities and personal potential) and in dealing with others professionaly, (i.e., confidence as a leader and teacher). Becoming competent in specific fields (sports, etc.) has helped me realise that beyond the realization of immediate goals is life and future--God and religion. It has helped me spiritually.

As a 2nd Year Practice Teacher (1st year in P.E., in July Practicum 1982) I found through Years 7-10 in P.E. class, the students who were keenest at exercise (not necessarily the most competent) were often the best temperamented, the most socially adapted and generally keen, academically. They also appeared to be the most mature generally in attitudes.

Female student (21)

I think that my boyfriend really enjoys the exercise he is doing and it has affected him in some ways. For example, he has become very 'health' conscious which in turn has an effect on me. He is a lot more conscious of keeping fit, and enjoys this. He also works towards goals, particularly in gymnastics and this is a real challenge for him, which he takes seriously; and therefore he does a lot of work to achieve these goals. Other exercise such as basketball is not an enjoyment for him mainly because he gets too emotionally involved!!! He would much rather participate in individual type activities as he can push himself to achieve the goal he sets himself. (This is a lot less frustrating.)

I think he is a much happier person while he is doing some sort of regular activity, and "overall a more balanced person."

As far as the spiritual aspect of his life goes I am not sure that I can see any direct relationship between an increase in physical activity and a better relationship with God. However, this has occurred with both of us over the year and I feel it may be a result of outreach in which we both are involved.

Case History 4

Wife (19)

Aerobic exercise affects me both physically and psychologcially. I am a stronger and more agile person through weight loss. I am more concerned about eating nourishing food, and obtaining adequate sleep. My state of well-being is greatly improved through becoming less depressed and attacking more vigorously the routine things of life. My husband's appearance has improved along with his mental confidence and ability to do extra work with little extra effort. He seems to develop a real zest for life. However, on the negative side, in my opinion, he can become very competitive and aggressive--something which I don't particularly like.

Husband (20)

I find aerobic exercise an essential ingredient to my life if I am to maintain a good general outlook. My physical appearance improves along with sleep patterns and mental energy. I find that I can perform activity in life with much more vigor and enthusiasm. My wife definitely lost weight and became a fitter person and began to think more of herself and to see herself in a more favourable light. Her eating habits improved also.

BIBLIOGRAPHY

Books

Argyle, Michael. The Psychology of Interpersonal Behaviour. Middlesex, England: Pelican Books, 1967.

Babbage, S. Barton. Man in Nature and in Grace. Grand Rapids, Michigan: Eerdmans, 1957.

Baird, John E. Jr. and Weinberg, Sanford B. Communications: The Essence & Group Synergy. Dubuque, Iowa: Wm. C. Brown Co., 1977.

Berkouwer, G. C. Man: The Image of God. Grand Rapids, Michigan: W. B. Eerdmans Publishing Company, 1962.

Bradburn, Norman. The Structure of Psychological Wellbeing. Chicago: Aldine Publishing Company, 1969.

Brandon, Owen R. "Body," Baker's Dictionary of Theology (Grand Rapids, Michigan: Baker Book House, 1960), pp. 101-102.

Buttrick, George Arthur, ed. The Interper's Dictionary of the Bible. 5 vols. Nashville, Tennessee: Abingdon, 1962.

Cashman, Richard and McKernan, Michael, eds. Sport in History. St. Lucia, Queensland: University of Queensland Press, 1979.

Cheraskin, E. and Ringsdorf, W. M. Jr. Predictive Medicine: A Study in Strategy. Mountain View, California: Pacific Press, 1973.

Clinebell, Howard J., Jr. The People Dynamic: Changing Self and Society Through Growth Groups. New York: Harper and Row, 1972.

Collins, Gary R. Christian Counselling: A Comprehensive Guide. Waco, Texas: Word books, 1980.

_____, ed. Helping People Grow: Practical Approaches to Christian Counselling. Santa Ana, California: Vision House, 1980.

_____. How to be a People Helper. Santa Ana, California: Vision House, 1976.

Conway, Donald. The Great Australian Stupour. Melbourne: Sun Books, 1971.

Cooper, Cary L. The Stress Check. New Jersey: Prentice-Hall Inc., 1981.

Cooper, Kenneth H. The New Aerobics. New York: Bantam Books, 1970.

Csikszentmihalyi, Mihaly. Beyond Boredom and Anxiety. San Fransisco: Jossey-Bass Pub., 1975.

Cureton, Thomas Kirk, Jr. Physical Fitness and Dynamic Health. Dial Press, 1965.

Complete Works of Josephus. Translated by William Whiston. Foreward by William Sanford LaSor. Grand Rapids, Michigan: Kregel Publications, 1960.

Douglas, J.D., ed. The New Bible Dictionary. London: Inter-varsity Fellowship, 1962.

Editors of Runners World. The Complete Runner. Mountain View, California: World Publications, 1974.

Eggers, Gary. The Sport Drug. Sydney: George Allen and Unwin, 1981.

Fixx, James F. The Complete Book of Running. Collingwood, Victoria: Outback Press, 1978.

Fogarty, John E. Preventative Medicine USA. New York: Prodist, 1976.

Freeman, William H. Physical Education in a Changing Society. Boston: Houghton Miflin Co., 1977.

Gates, John F. Adventures in the History of Philosophy. Grand Rapids, Michigan: Zondervan Publishing House, 1961.

Gill, Mabel K. Mind, Body and Religion. Nashville, Tennessee, Southern Publishing Association, 165.

Glasser, William. Positive Addiction. New York: Harper and Row, 1976.

Graham, Peter J., and Klar, Lawrence R. Planning and Delivering Leisure Services. Dubuque, Iowa: Wm. C. Brown & Co., 1979.

Hardinge, Mervyn G. A Philosophy of Health. Loma Linda, California: Loma Linda School of Health, 1978.

Harrison, Everett F., ed. Baker's Dictionary of Theology. Grand Rapids, Michigan: Baker Book House, 1960.

Harrison, R. K. "Healing," Interpreter's Dictionary of the Bible (Nashville: Abingdon Press, 1962), 2:541-8.

Hastings, James, ed. A Dictionary of the Bible. 5 vols. Edinburgh: T. & T. Clark, 1898.

Higdon, Hal. Fitness After Forty. Mountain View, California: World Publications, 1977.

Hyder, O. Quentin. Shape Up: A Christian's Guide to Total Fitness. Old Tappan, New Jersey: Fleming H. Revell Co., 1979.

James, Muriel E. Born to Love. Reading, Massachusetts: Addison Wesley Publishing Company, 1973.

Johnson, David W. and Johnson, Frank P. Joining Together: Group Theory and Group Skills. Englewood Cliffs, New Jersey: Prentice-Hall, 1975.

Kittel, Gerhard, ed. Theological Dictionary of the New Testament. 9 vols. Grand Rapids, Michigan: Eerdmans, 1964-74.

Laidlaw, J. "Body," Dictionary of the Bible (Edinburgh: T. & T. Clark, 1898), 1:309.

Lloyd-Jones, D. Martyn. Spiritual Depression: Its Causes and Cure. London: Pickering and Inglis, 1965.

McMillen, S. I. None of These Diseases. New Jersey: Fleming H. Revell Company, 1963.

McCamy, John C. and Presley, James. Human Life Styling. New York: Harper and Row, 1977.

Minear, Paul S. Images of the Church in the New Testament. Philadelphia: The Westminster Press, 1960.

_____. "Christ, body of," The Interpreters' Dictionary of the Bible (Nashville, Tennessee: Abingdon, 1962), 1:571.

Moltmann, J. R. Man: Christian Anthropology in the Conflicts of the Present. Philadelphia: Fortress Press, 1979.

Morris, L.L. "Flesh," The New Bible Dictionary (London: Inter-varsity Fellowship, 1962), pp. 425-6.

Oosterwal, G. Patterns of S.D.A. Church Growth in North America. Berrien Springs, Michigan: Andrews University Press, 1976.

Peele, Stanton R. and Brodsky, Archie. Love and Addiction. New York: Signet Books, 1976.

Powell, John. Why Am I Afraid To Tell You who I Am? Illinois: Argus Communications, 1976.

Reynolds, Ingrid, and Rizzo, Cowcetta. Psychological Problems and Sydney Adults. Sydney: Adept Printing Pty. Ltd., 1979.

Robinson, John A. T. The Body. London: SCM Press Ltd, 1961.

Russo, Perce F. Aussie Robics. Sydney: Summit Books, 1978.

Schweizer, Eduard. "sōma," Theological Dictionary of the New Testament (Grand Rapids, Michigan: Wm. B. Eerdmans, 1964), 7:1025-94.

Seyle, Hans. Stress Without Distress. Philadelphia: J. B. Lippincott Company, 1974.

Stedman, Ray C. Body Life. Glendale, California: Regal Books, 1972.

Tubesing, Donald A. Wholistic Health. New York: Human Sciences Press, 1979.

Van Dolson, Leo R., and Spangler, J. Robert. Healthy Happy Holy. Washington, D.C.: Review and Herald Publishing Association, 1975.

Weekes, Clarie. Peace From Nervous Suffering. Sydney: Angus and Robertson Ltd, 1972.

_____. Self Help for Your Nerves. Sydney: Angus and Robertson Ltd, 1962.

White, Ellen G. Counsels on Health. Mountain View, California: Pacific Press, 1951.

_____. Fundamentals of Christian Education. Nashville, Tennessee: Southern Publishing Association, 1923.

_____. Guidelines to Mental Health. Takoma Park, Washington D.C.: Ellen G. White Estate, 1966.

_____. The Ministry of Healing. Mountain View, California: Pacific Press, 1942.

Williams, J. Clifton. Human Behaviour in Organizations. Cincinnati, Ohio: South Western Publishing Company, 1978.

Articles

Cooper, Lowell. "Athletics, Activity and Personality: A Review of the Literature." The Research Quarterly 40(February 1969): 17-21.

Insel, Paul M.; Roth, Walton T.; and Kenefict, Madeleine. "Jogging, an Antidote to Tension." Life and Health (January 1977) 1:18-21.

Levy, Robert I. "Review: Cholesterol, Lipoproteins, Apoproteins and Heart Disease: Present Status and Future Prospects." Clinical Chemistry 27(May 1981): 653-62.

Start, Brian. "Competitive Behaviour and Stress Fitness." The Australian Journal for Health, Physical Education and Recreation No. 92(Winter 1981):3-7.

Von Tungeln, Annie L. "Leisure--A Personal Challenge." Life and Health April 1980, pp. 28-30.

Webster, Ian W. and Rawson, Graeme K. "Health Status of Seventh-day Adventists." The Medical Journal of Australia 66:1 (19 May 1974): 417-20.

Zurcher, Jean R. "Christian View of Man: I." Andrews University Seminary Studies 2 (1964): 156-68.

_____. "Christian View of Man: II." Andrews University Seminary Studies 3 (1965): 66-83.

Unpublished Manuscripts

Eggers, Gary. "Sport and Drug Addiction." Department of Recreation, N.S.W., 1981.

"Scientific Extracts: An Illustration of Healthful Living." School of Health, Loma Linda University, 1976.

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