THE EFFICACY OF MINERAL THERAPY IN THE TREATMENT OF ATTENTION DEFICIT CHILDREN WITH HYPERACTIVITY

by

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I, Nadine Muller, do hereby declare that this dissertation represents my own work both in conception and execution.

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ABSTRACT

The aim of the study was to evaluate the efficacy of Mineral Therapy in the treatment of Attention Deficit Disorder with Hyperactivity (ADDH), with regard to inattention, impulsivity and hyperactivity, in order to demonstrate Mineral Therapy as an alternative to cerebral stimulants, such as Methylphenidate Hydrochloride (Ritalin). It was hypothesized that the Mineral Therapy would result in a substantial improvement in all aspects of ADDH, and could consequently be used as an alternative treatment in a number of cases.

The study was a clinical trial, in which a placebo control group was compared with two experimental groups. The study was undertaken over a period of two years. Sixty attention deficit children with hyperactivity attending Livingstone Primary School were analyzed. The children involved in the study already taking Ritalin, administered and monitored by their physicians, were randomly divided, by the participating pharmacist, into two groups: one receiving placebo and Ritalin (n = 20); the other Mineral Therapy and Ritalin (n = 20). The balance of the children, who were not taking Ritalin, was given Mineral Therapy only (n = 20). Each of the subjects was treated and observed over a period of four months for the purpose of this study.

Prior to and on completion of the four-month course of Mineral Therapy each subject completed two assessment tests, namely the Children's Checking Task and the Feuerstein Test. Additionally,

the teachers recorded their direct observations of the actions and behaviour exhibited by each child, initially and at 6 week intervals, in the classroom, according to the Conners' Abbreviated Teacher's Rating Scale, and the teachers and researcher completed the Activity Level Scale, prior to and on completion of the study.

The results of the above tests and observations were analyzed statistically, using the analysis of variance technique and least significant difference method. The alpha value was set at the 0.05 level of significance.

Collectively, all aspects of ADDH, namely inattention, impulsivity and hyperactivity, together with the overall clinical picture of the testees improved. However, significant differences were found between the placebo and the two experimental groups only with regard to the activity level (15,35% and 21,87% respectively) and the overall clinical features (17% and 21,16% respectively).

From the results, it was apparent that Mineral Therapy is effective in decreasing the hyperactivity exhibited by an ADDH child, and that it consequently improves the overall clinical picture. Therefore Mineral Therapy can be used as an alternative treatment to cerebral stimulants, such as Methylphenidate Hydrochloride (Ritalin), in some cases of Attention Deficit Disorder with Hyperactivity and as a reinforcing treatment in other cases.

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TABLE OF ABBREVIATIONS

ADDH	Attention Deficit Disorder with Hyperactivity
CCT	Children's Checking Task
CNS	Central Nervous System

DEFINITION OF TERMS

1. **Attention Deficit Disorder with Hyperactivity** is a significant deficiency in age-appropriate attention, impulse control and rule governed behaviour (compliance, self control and problem solving) that arises in infancy and early childhood; it is significantly pervasive in nature and is not the direct result of general intellectual retardation, severe language delay and emotional disturbance or gross sensory or motor impairment (Barkley, 1982).

2. **Inattention** is the absence of attention which refers to the ability to maintain effort or concentration over time while performing a monotonous task (Schain, 1978).

3. **Impulsivity** is a tendency to react suddenly without reflection (Kagen, 1966). The reflective child is better able to delay immediate response and to consider other possible solutions, whereas the impulsive child responds with the first possible answer (Kagen, 1966).

4. **Hyperactivity** is excessive or exaggerated muscular activity, for example, aimless and haphazard running or fidgeting (Coleman, Butcher & Carson, 1980).

CHAPTER ONE

1. INTRODUCTION

Children presenting with inattention, impulsivity and hyperactivity constitute a large portion of the behavioural problems seen in paediatric practice (Rostain, 1991). It is estimated that 5% to 20% of primary school children in the USA are diagnosed as Hyperactive (Lambert & Sandoval, 1980).

Current views regarding these difficult-to-manage children emphasize attentional deficits, in addition to the associated behavioural problems that characterize the disorder. Although controversy still surrounds the diagnosis and treatment of Attention Deficit Disorders with Hyperactivity (ADDH), it is generally agreed that there are large numbers of children whose inability to sit still, concentrate and complete tasks presents numerous challenges to them and their teachers, parents and peers (Whalen & Henker, 1980; Campbell & Werry, 1986).

Methylphenidate Hydrochloride (Ritalin), classified in South Africa as a schedule-7 drug, is the principal pharmacological treatment used for ADDH patients (Schutte, 1988; Rostain, 1991). Ritalin has been shown to improve attention span and impulse control, and to reduce activity levels (Barkley, 1981; Shaywitz & Shaywitz, 1984); however, it has been less effective in improving school achievement (Riddle & Rapaport, 1976; Charles

& Schain, 1981), and the prognosis of the child remains the same after treatment, despite improvements in general behaviour (Charles & Schain, 1981; Schutte, 1988).

Some authors recommend using cerebral stimulants to treat short attention span regardless of whether or not the diagnosis of ADDH is made (Davy & Rogers, 1989), and it is estimated that 3% to 6% of primary school children in the United States of America receive cerebral stimulant medication on a regular basis (Safer & Krager, 1988). Unfortunately there is a growing dissatisfaction with these drugs, as not all the children treated demonstrate a good clinical response (Whalen & Henker, 1980) and some children experience adverse effects, some of which are serious enough to warrant discontinuation of the medication (Rostain, 1991). Adverse effects include appetite suppression, sleep disturbances, irritability and various physical complaints, such as headaches and stomach aches (CIBA, 1984; Klein et al.,1988; Barkley, McMurray & Edelbrock, 1990).

Mineral Therapy, on the other hand, is non-toxic and non-injurious: side effects and withdrawal symptoms are unknown and the minerals are completely compatible with and reinforcing to any other forms of treatment being used simultaneously (Blackmore Laboratories, 1980).

In 1873 a German physician, William Schuessler, identified twelve different mineral salts that are essential for human health. Schuessler believed that these minerals were not only important

for building and maintaining health, but that they could also be used to treat disease (Boericke & Dewey, 1984).

Over the past twenty years, knowledge of cellular biochemistry has increased considerably, resulting in a new appreciation of the role minerals play in human metabolism. Their functions in the body are diverse and it is essential that their absolute amounts and relative balances be maintained within narrow limits (Fisher, 1978). Any drop in concentrations within the cell or in the interstitial fluid results in marked physiological changes, such as alterations in nerve irritability and muscle contractility (Fisher, 1978). Therefore the physical and mental health status of an individual can be significantly affected by a drop in mineral concentration.

According to Schuessler's theory, the symptoms presented by an ADDH child, such as restlessness, poor concentration, irritability and sensitivity to external stimuli, are primary indicators of various mineral deficiencies. Consequently, if the body's chemistry is improved by supplementation of these indicated minerals, this should result in an amelioration or substantial improvement in the presenting symptoms of an ADDH child (Fisher, 1978), as was demonstrated by the Australian Federal Government's Committee of Inquiry into Chiropractic, Osteopathy, Homeopathy and Naturopathy (1977).

Therefore the aim of the study was to evaluate the efficacy of Mineral Therapy in the treatment of Attention Deficit Disorder

with Hyperactivity, with regard to inattention, impulsivity and hyperactivity, in order to demonstrate Mineral Therapy as an alternative to cerebral stimulants, such as Methylphenidate Hydrochloride (Ritalin).

CHAPTER 2

2. REVIEW OF THE RELATED LITERATURE

2.1 ATTENTION DEFICIT DISORDER WITH HYPERACTIVITY

On occasion, most people have been inattentive, impulsive, overly energetic, disconcerted or intractable. The hyperactive child is one who is seen - by parents, teachers, physicians, or all three - as having too many of these characteristics, far too much of the time.

The hyperactive child syndrome was first described more than 150 years ago by the German physician, Heinrich Hoffmann. Since then many authors have outlined the syndrome which begins early in life and presents as hyperactivity, impulsivity and inattention. It has been variously known as hyperkinesis, mineral brain dysfunction, hyperactivity and most recently, Attention Deficit Disorder with Hyperactivity (ADDH). (Campbell & Werry, 1986.)

The prevalence of ADDH is estimated at 5% to 20% of primary school children in the United States of America (Lambert & Sandoval, 1980) and more boys seem to be affected by this disorder than girls at a ratio of approximately 4:1 (Safer & Allen, 1976; Lambert & Sandoval, 1980).

2.1.1 AETIOLOGY

The exact aetiology of ADDH is unknown, but various causative factors are thought to be of importance:

- **Genetic factors:** There is a significant genetic contribution to the individual differences in activity levels and attention abilities (Stevenson, 1992).

- **Temperament:** Children who have been active from day one are likely to remain so. Thus the child's temperament and personality play an important part in the development of this syndrome. (Graham, 1986.)

- **Neurochemical:** Abnormalities in the dopamine metabolism have been found (Rapoport, Quin & Lamprecht, 1974; Levy, 1991). A deficit in tonic adrenaline mediated inhibition of the locus coeruleus was shown by Metford and Potter (1989). Using MRI techniques Hynd **et al.** (1991) showed a difference in the corpus callosum morphology between the brains of hyperactive and normal children. Moreover, Benson (1991) proposed that children with ADDH have dysfunction in the right sided frontal-striatal system.

- **Diet:** Hyperactivity has been related to the presence of various additives and colouring substances in food (Rowe, 1988), and additive free diets are often prescribed with success (Kaplan **et al.**, 1989). The role of glucose

metabolism was analyzed by Zametkin (1990) and was found to be an important factor.

- **Social Factors:** Children living in poor social conditions, with inadequate housing and stretched financial resources, are more likely to exhibit behavioural problems (Richman, Stevenson & Graham, 1982).

- **Parental Behaviour:** Mothers of hyperactive children are often shown to be unresponsive to the child's demands and the child's hyperactivity is merely an attempt to illicit a response (Graham, 1986).

The various causative influences are rarely seen in pure form, but more commonly in combinations.

2.1.2 PRINCIPAL CHARACTERISTICS OF ADDH

Almost every symptom of psychopathology has at some stage been included under the rubric of 'hyperactivity', although hyperactivity, inattention, poor impulse control, noncompliance, specific cognitive deficits and neurological symptoms have usually figured prominently (Aman, 1984).

ADDH is classified as a disruptive behavioural disorder in the American Psychiatric Association's Diagnostic and Stastistical Manual of Mental Disorders (DSM - III R). The purpose of the

DSM - III R is to provide clear descriptions of diagnostic categories in order to enable clinicians and investigators to diagnose, communicate about, study and treat various mental disorders. The DSM - III R criteria are the most widely used and accepted characteristics employed to diagnose ADDH, and are likely to dominate clinical thinking for the foreseeable future (American Psychiatric Disorders, 1987; Rutter & Shaffer, 1980).

The DSM -III R criteria restrict the symptoms of ADDH to three areas: attention, impulsivity and hyperactivity. In addition, there are chronological and exclusionary criteria. The criteria, all of which must be present, are (American Psychiatric Association, 1987):

- **Inattention:** At least three of the following:
  - i) Often fails to finish things he starts.
  - ii) Often doesn't seem to listen.
  - iii) Easily distracted.
  - iv) Has difficulty concentrating on schoolwork and other tasks.
  - v) Has difficulty maintaining a play activity.

- **Impulsivity:** At least three of the following:
  - i) Often acts before thinking.
  - ii) Shifts excessively from one activity to another.
  - iii) Has difficulty organizing work.
  - iv) Needs lots of supervision.

v) Frequently calls out in class.

vi) Has difficulty awaiting turns in games.

- **Hyperactivity:** At least two of the following:

  i) Runs about and climbs on things excessively.

  ii) Has difficulty sitting still and fidgets excessively.

  iii) Has difficulty staying seated.

  iv) Moves about excessively during sleep.

  v) Is always 'on the go' and acts as if 'driven by a motor'.

- **Onset:** Before the age of seven.

- **Duration:** A period of at least six months.

- Not due to Schizophrenia, Affective Disorders, or Severe Mental Retardation.

Characteristically the child will, from babyhood, have been restless, a difficult feeder, and a poor sleeper. Once the baby starts walking, he is more mobile than other children. The high level of activity means that the child is particularly prone to accidents. As the infant gets older, he is expected to spend more time on pursuits involving concentration, but it is seen that he is highly distractible and cannot settle down to any activity for more than a brief period. Puzzles, toys and picture books do not engage his attention. Although he may be able to

sit in front of the television for an indefinite period, it is noticeable that he is fidgety. (Campbell & Werry, 1986.)

Entry into a school facility may bring to light a problem that has been present for some time, because the child is suddenly expected to conform and to cope with more structured expectations (Graham, 1986).

A hyperactive child also faces severe impediments to his achieving success at school, because his problems such as short attention span, poor organization skills, lack of goal orientation and extreme difficulty in following oral instructions, militate against efficient learning. A hyperactive child is also grossly affected by the environment, both visual and auditory, and thus he cannot concentrate if more than one activity is taking place at the same time. (Graham, 1986.)

Misconduct is manifested by over 80% of hyperactive children. These children do not get along well with their peers. They often fight, quarrel, are disobedient and aggressive with a low frustration tolerance. (Safer & Allen, 1976.)

As the child gets older, hyperactivity usually becomes less of a problem, but defects in attention and concentration may persist (Rostain, 1991). However, in some children hyperactivity continues to be a problem in adolescence (Barkley et al., 1991; Fischer et al., 1993) as well as in adulthood (Shekim et al., 1990; Denckla, 1991; Bellak & Black, 1992). This may lead to

learning problems, lack of inhibition and impulsiveness, which may result in anti-social behaviour and criminality (Cadonet & Stewart, 1991).

2.2 TREATMENTS

2.2.1 METHYLPHENIDATE HYDROCHLORIDE (RITALIN)

Psychostimulant medication, e.g. methylphenidate hydrochloride, has been the most extensively used intervention for ADDH and related disruptive disorders (Brown, 1991), and over the last decade its use has increased dramatically (Schutte, 1988; Rostain, 1991).

2.2.1.1 WHAT IS METHYLPHENIDATE HYDROCHLORIDE?

Methylphenidate Hydrochloride (Ritalin) is a mild central nervous system stimulant (CIBA, 1984). In 1959 Ritalin was patented by CIBA Pharmaceutical Company and is classified in South Africa as a schedule-7 drug, indicating that it must be administered with caution. It is a white, odourless, fine crystalline powder, and is freely soluble in water.

Ritalin enhances the action of certain neurotransmitters, i.e. catecholamines, by inducing their release from the presynaptic neuron, blocking their uptake and inhibiting the action of

monamine oxidase (Donnelly & Rapport, 1985). Through this action at a neurochemical level, Ritalin appears to stimulate the reticular activating system, the limbic system, striatum and other regions in the brain presumed to control attention, arousal and inhibitory processes (Evans, Guiltieri & Hicks, 1986). A 'paradoxical effect' is thus produced by this CNS stimulant in some hyperactive children, resulting in the drug acting as a tranquilliser of sorts (Cooter, 1988).

2.2.1.2 THE EFFECTS OF METHYLPHENIDATE HYDROCHLORIDE

Ritalin's greatest positive effects are from an educational perspective: it enhances certain behavioural, cognitive and academic processes (Abikoff & Gittelman, 1985; CIBA, 1984).

Ritalin has been shown to improve attention (Rapport et al., 1987; Barkley et al., 1988) and impulsivity by improving the efficiency of the central inhibitory mechanism (Tannock et al., 1989), and it has resulted in improvements in short term recall (Barkley et al., 1988) and reduction in disruptive, out of seat behaviour (Werry & Conners, 1979; Whalen, Henker & Finck, 1981).

Ritalin's role with regard to academic achievement is controversial: various studies have shown an improvement in reading ability (Cooter, 1988; Forness et al., 1991) and arithmetic performance (Carlson et al., 1991), while other studies have shown that scholastic achievement is not improved

very much (Gadow, 1983; Schutte, 1988). Barkley and Cunningham (1978) concluded that "...the major effect of stimulants appears to be an improvement in classroom manageability rather than in academic performance, and should only be used when the primary goal of treatment is to improve manageability."

Ritalin has further behavioural effects with respect to increased compliance, independent play and responsiveness to social interactions with parents, teachers and especially peers, as hyperactive children have extensive and enduring problems in the social arena (Whalen et al., 1989; Mino & Ohara, 1991; Whalen & Henker, 1991). Buhrmester et al. (1992) found, however, that stimulant medication had a general dampening effect on social behaviour, significantly reducing social engagement and increasing dysphoria. However, Ritalin has also been shown to lessen aggressive behaviour displayed by many hyperactive children, which has resulted in more acceptable social interaction (Hinshaw et al., 1989).

Controversy has also surrounded dosage, as there is a great deal of individual variability in the dose response, so the dose must be triturated for the optimal effects in each child (Rapport et al., 1989; Stevenson & Wolraich, 1989; Barkley, Du Paul & Murray, 1991). On the whole it has been reported that low doses increase attention and high doses decrease motor activity; but high doses also decrease learning (Cooter, 1988; Rosenham & Seligman, 1989; Tannock et al., 1989).

2.2.1.3. SIDE EFFECTS OF METHYLPHENIDATE HYDROCHLORIDE

While Ritalin may be helpful in regulating some behaviour in hyperactive children, it is not without side effects.

The cardiovascular system is clearly affected by Ritalin: significant increases in diastolic blood pressure and an increase in heart rate have been noted. It is therefore recommended that the blood pressure be monitored in all patients taking Ritalin. (Cooter, 1988; Brown & Sexson, 1989.)

Other side effects include nervousness, insomnia, hypersensitivity, anorexia, nausea, dizziness, palpitations, headache, dyskinesia, drowsiness, angina, cardiac arrythmia, abdominal pain and weight loss. There are also reports of cases with rare side effects such as visual disturbances, toxic psychosis, anaemia, scalp hair loss and Tourette's Syndrome (CIBA, 1984; Barkley, McMurray & Edelbrock, 1990; Anastopoulos, Du Paul & Barkley, 1991).

Ritalin has been shown to decrease growth rates, but research has also shown that once the child stops taking Ritalin, he catches up with his peers and no long term growth problems occur (Klein **et al.**, 1988).

The development of drug dependence is troublesome, especially when Ritalin is taken over a long period of time. Thus careful supervision is required during drug withdrawal to avoid

complications (Cooter, 1988; Divoky, 1989).

An additional complaint is the marked deterioration in behaviour occurring in late afternoon and evening, following daytime medication administration - this is known as a 'rebound effect' (Johnstone et al., 1988).

2.2.2 MINERAL THERAPY

Over the past 20 years there have been considerable advances in electron microscope and X-ray diffraction techniques. Consequently knowledge of cell biochemistry, especially in the field of enzymes, has increased considerably, resulting in a new appreciation of the role minerals play in human metabolism.

For one reason or another, an organism can slowly become deficient of minerals. According to Fisher (1978), mineral deficiencies represent, for the most part, the lowest denominator of disease. All other pathological and functional changes are secondary, and if cognisance is not taken of this fact, all treatment will have only a superficial and temporary effect. This is because all body functions are dependent on the presence of minerals in sufficient quantities, e.g. the body can burn fat in the absence of glucose, but if there is no magnesium, then no catabolism can take place at all.

2.2.2.1 HISTORY

For centuries minerals have been used in various forms for the treatment of human illness according to various philosophies.

In the 1700's Dr Samuel Hahnemann, founder of the Homoeopathic system of medicine, did extensive research on the therapeutic effect of sodium, silica and calcium, as well as on the effect of hundreds of other plant and animal substances. He established the theory of 'similia similibus curantur' (like cures like), and medicines were subsequently prepared according to the process of successive dilutions and succussions, called 'trituration and potentisation', until infinitesimal quantities of the crude substance remained. (Boericke & Dewey, 1984.)

In 1873 Dr William H. Schuessler proposed a system he called 'Biochemistry', consisting of 12 mineral compounds which he named 'tissue salts'. The theory upon which this system is based is that the structure and vitality of the organs of the body are dependent on certain quantities of organic constituents, and that these 12 'tissue salts' remain in the form of ashes after the combustion of living tissues. Thus any disturbance in the molecular motion of these salts constitutes disease, which can be rectified by re-establishing equilibrium using the 'tissue salts'. The Schuessler system relies on a chemico-physiological dose and the tissue salts are prepared according to homoeopathic law to 6XH potency (1:1 000 000). (Goodwin, 1980; Boericke & Dewey, 1984.)

In 1930, an Australian Naturopath, Maurice Blackmore, formulated the Celloid concept and Celloid Mineral Therapy became an established Naturopathic modality. It is based on the application of 11 mineral compounds in physiologically active doses, according to Schuessler's indications for prescribing. The minerals are prepared in an alcohol and lactose slurry, which is evaporated and the resulting solids are compressed in a tablet form. (Fisher, 1978.)

2.2.2.2. THE BASIC PRINCIPLE OF MINERAL THERAPY

The body is composed of an enormous number of cells, each consisting of a balanced quantity of 3 classes of materials: water, organic substances and inorganic substances. Water and the organic substances, such as carbohydrates, proteins and lipids, make up the greater percentage of the body. Although the inorganic elements constitute only a small percentage, their function is vital. (Soloman & Davis, 1983.)

There are over 2000 enzymes in the body and a large percentage of these require minerals to enable them to function effectively (Guyton, 1992). Therefore the absence of a single mineral or enzyme may result in the disruption of the body's metabolism and consequently disease may occur in one form or another. However, cell nutrition may be restored and cellular metabolism normalized by supplementing the diet with the relevant mineral (Blackmore Laboratories, 1980; Tratler, 1987).

2.2.2.3 MINERAL DEFICIENCIES

Mineral deficiencies can come about in a number of ways (Fisher, 1978; Blackmore Laboratories, 1980):

i) Inadequate nutrition;

ii) Mineral deficiency in plants due to the poor soil in which they are grown, usually as a result of poor agricultural methods being used over years;

iii) Failure of the body to assimilate vitamins and minerals.

2.2.2.4. FUNCTIONS OF MINERALS IN THE BODY

The functions of minerals are diverse, but can be summarized as follows (Fisher 1978; Blackmore Laboratories, 1980; Soloman & Davis, 1983; Guyton, 1992):

- **Structural:** A constituent of bone, teeth, connective tissue and cell membranes. A stabiliser of large molecular structures.

- **Electrochemical:** Regulation of osmotic and acid-base balance. A stabiliser of cell membrane electrical gradients.

- **Metabolic:** Enzyme activators which affect most metabolic pathways and cellular functions.

The following five mineral compounds were selected for use in the study because of their physiological functions and pathological deficiency prescribing indications (Fisher, 1978; Blackmore Laboratories, 1980):

i) **POTASSIUM PHOSPHATE**

Potassium is the principal positive ion within cells and influences muscle contraction and nerve excitability (Soloman & Davis, 1983).

DEFICIENCY SYMPTOMS AND THERAPEUTIC USES OF POTASSIUM PHOSPHATE:

- Neurological disorders: Weakness, lethargy, listlessness, anorexia, irritability;
- Muscular weakness and paralysis;
- Neuromuscular disorders such as exaggerated reflexes, restlessness, sensitivity to external stimuli, twitches and spasms.

ii) **MAGNESIUM PHOSPHATE**

Magnesium is a component of many coenzymes. The appropriate balance between magnesium and calcium ions is needed for normal muscle and nerve functioning (Soloman & Davis, 1983).

DEFICIENCY SYMPTOMS AND THERAPEUTIC USES OF MAGNESIUM PHOSPHATE:

- Sleep disturbances;
- Loss of nerve regulation, extreme irritability, neurotic disorders, difficulty in recall and concentration;
- Muscular cramping, twitches and spasm;
- Learning difficulties and behavioural disorders in children.

iii) **SODIUM PHOSPHATE**

Sodium is the principal positive ion in the interstitial fluid. It plays an important role in the fluid balance and is essential for the conduction of nerve impulses (Soloman & Davis, 1983).

DEFICIENCY SYMPTOMS AND THERAPEUTIC USES OF SODIUM PHOSPHATE:

- Excess acidity in cellular tissues and urine, rheumatism, kidney stones and muscle stiffness;
- All conditions characterised by a sour acidic sweat;
- As a direct digestive buffer, in all conditions of acidity, reflux and pyrosis after meals.

iv) **CALCIUM PHOSPHATE**

Calcium is an important component of bone and teeth. It is

essential for normal blood clotting and is needed for normal muscle and nerve function (Soloman & Davis, 1983).

DEFICIENCY SYMPTOMS AND THERAPEUTIC USES OF CALCIUM PHOSPHATE:

- All bone and teeth disorders;
- Disorders of glandular secretions. Poor digestion and assimilation of food;
- Nervous irritability and insomnia. Hyperactivity;
- Neuromuscular disorders such as cramps, twitches and convulsions;
- Frequent colds and low resistance to infection.

v) **IRON PHOSPHATE**

Iron is a component of haemoglobin, myoglobin, important respiratory enzymes (cytochromes) and other enzymes essential to oxygen transportation and cellular respiration (Soloman & Davis, 1983).

DEFICIENCY SYMPTOMS AND THERAPEUTIC USES OF IRON PHOSPHATE:

- Growth and Pregnancy;
- Nutritional Iron Deficient Anaemia;
- Low resistance to infection.

2.2.2.5. SIDE EFFECTS OF MINERAL THERAPY

Mineral Therapy is curative and prophylactic, non-toxic and non-injurious. Side effects and withdrawal symptoms are unknown and the minerals are completely compatible with and reinforcing to any other forms of treatment being used simultaneously. (Fisher, 1978; Blackmore Laboratories, 1980.)

2.3 MINERALS AND HYPERACTIVITY

The role of nutrition in Homoeopathic practice was analysed by Stewart (1986), and Hahnemann (1982) made reference in the ORGANON to the use of diet as a component of treatment in the broader Homoeopathic approach (paragraph 208):

> "The age of the patient, the mode of living and diet... must next be taken into consideration in order to ascertain whether these things have tended to increase his malady, or in how far they may favour or hinder the treatment."

The Feingold diet was introduced by a naturopathic practitioner and has been used to treat hyperactivity with great success by many Naturopaths (Trattler, 1987). Substantial improvements in behaviour were demonstrated when all refined or devitalized foods, poisoned by additives, food colouring, preservatives, flavourings or pesticides, had been removed from the diet and only fresh organic foods had been eaten. These results were

confirmed by Rowe (1988).

Kaplan et al. (1989) showed the effects of dietary supplementation with a multivitamin in 24 preschool-age hyperactive boys over 10 weeks. Diets were well balanced, low in simple sugars, and all preservatives, artificial colourings and caffeine were removed. More than half the children showed improvement in behaviour, and in non-behavioural variables such as night wakening and latency in getting to sleep, negligible placebo effects were shown.

Haslam (1992) and Crook (1992) demonstrated the effective role of megavitamins therapy in the treatment of ADDH. In both studies large doses of vitamins, especially the B complex vitamins, were administered to hyperactive children and a substantial improvement in behaviour was noted.

In 1974 the Australian Federal Government set up a Committee of Inquiry into Chiropractic, Osteopathy, Homoeopathy and Naturopathy. The findings of this Committee with regard to the treatment of 34 hyperactive children using mineral therapy for three and a half months at the Austin Hospital Clinical School, were published in April 1977. The results showed a substantial improvement in the group using mineral treatment, but not in the group where the testees had placebo treatment. Another striking result was that at the end of the study, despite the stringent double-blind situation, the Naturopath was able to correctly identify 70% of the children who had been placed on active

treatment. The fact that he could recognize the classical response patterns to his naturopathic treatment, indicated that these substances gave rise to a recognizable and predictable clinical effect.

2.4 SUMMARY

ADDH is a condition characterized by inattention, impulsivity and increased activity levels due to a variety of aetiologies, and it is treated in a variety of ways. Although the use of cerebral stimulants, such as Methylphenidate Hydrochloride (Ritalin), has been effective in alleviating the symptoms of ADDH, there is a growing disapproval of the treatment for the following reasons:

i) Not all children treated demonstrate a good clinical response to the medication (Whalen & Henker, 1980);

ii) Adverse side effects, such as elevation of the heart rate and blood pressure, nervousness, insomnia, appetite suppression and headaches occur (CIBA, 1984; Cooter, 1988);

iii) General behaviour may improve, but scholastic performance usually does not and the prognosis of the child remains the same as before the treatment (Charles & Schain, 1981; Schutte, 1988; Swanson et al., 1991).

This study attemped to demonstrate the efficacy of Mineral

Therapy as an alternative treatment to cerebral stimulants, as the minerals are very effective and non-injurious, even when taken over a protracted period of time (Blackmore Laboratories, 1980).

CHAPTER 3

3. MATERIALS AND METHODS

3.1 STUDY DESIGN

The study was a clinical trial, in which a placebo control group was compared with two experimental groups, in order to evaluate the efficacy of mineral therapy as an alternative treatment for ADDH.

The following steps were followed for each child, over the two year period, in the execution of the study:

i) Permission was granted by the erstwhile Natal Education Department to approach Livingstone Primary School for their co-operation in the study (Appendices E and F).

ii) An appointment was made with the Headmistress of Livingstone Primary School, Mrs Rulten, to discuss this study and to answer any questions which she may have had.

iii) The parents of each prospective participant were contacted telephonically to explain the study in terms of its significance, its objectives and the procedures which were to take place. Parents were requested to allow their children to take part in the study, as selection of the

children was done on a volunteer basis only and parental permission was essential for eligibility.

iv) An appointment was made with each parent, who wanted their child to partake in the study and who had further questions about the process involved.

v) The physician of each of the children concerned was contacted in order to explain the treatment the child would be using during the study, and to obtain the necessary information with regard to the treatment currently being used by the child. No changes were made to any existing prescriptions.

vi) As each child was identified for the study, they were allocated to one of the groups, by the participating pharmacist dispensing the mineral therapy, according to the selection procedure discussed in 3.2. on page 29 of this dissertation.

vii) Prior to the commencement of treatment, assessment tests, namely the Children's Checking Task (Schain, 1978) and the Feuerstein Test (Feuerstein et al., 1980) were completed on the school premises by each child participating in the study. The teachers recorded their direct observations of the respective children, with regard to their actions and behaviour in the classroom as stipulated in the criteria of the Conners' Abbreviated Teacher's Rating Scale

(Conners, 1973), and the teachers and researcher recorded their observations in terms of the Activity Level Scale (Gittelman, 1980). All the above results constituted the initial scores attained by each child.

viii) On completion of the initial assessment tests, the treatment was given to the parents to be administered to the respective children. As the treatment was to be administered from home, all instructions were clearly explained as per 3.3. on page 30 of this dissertation.

ix) After 6 weeks, each child and their parents were visited, to discuss any difficulties that were being experienced as well as the progress the child was making. Parents were encouraged to continue the administration of the minerals according to the original prescription. A second Conners' Abbreviated Teacher's Rating Scale (Conners, 1973) was completed by the teacher, to coincide with the 6 weekly follow-up visit to the parents.

x) Identical procedures were followed at 6 weeks and at 12 weeks.

xi) The final assessment for each subject took place on completion of the four month course of Mineral Therapy. The Children's Checking Task (Schain, 1978) and the Feuerstein Test (Feuerstein et al., 1980) were administered to each subject at the school. The teachers

recorded their direct observations of each child in the classroom as stipulated by the criteria in the Conners' Abbreviated Teacher's Rating Scale (Conners, 1973), and the teachers and researcher completed the Activity Level Scale observing each child under normal classroom conditions for 30 minutes (Gittelman, 1980). The results obtained from the tests and observation records constituted the final scores attained by each child.

xii) The final test scores were compared with the initial scores for each test, in order to determine the statistical significance, if any.

3.2 SUBJECTS

Eighty seven children from Livingstone Primary School in Durban were involved in the study. Of these, only 60 were used as the sample for reasons as discussed under 4.1 on page 37 of this dissertation.

No gender bias was intended in the study: the use of the pronoun 'he' or 'his' in the dissertation was merely for ease of reference.

The children were only considered eligible for the study if the following criteria were met:

- Children must have been diagnosed by a paediatrician as having Attention Deficit Disorder with Hyperactivity.
- Parental permission in the form of a signed consent form must have been obtained (Appendix K).

The sample was divided amongst 3 groups as follows:

Group 1. Placebo and Ritalin

Group 2. Mineral Therapy and Ritalin

Group 3. Mineral Therapy only

Children in Group 1 and 2 were already taking Ritalin, administered and monitored by their physicians, and no change was made to the prescription. These children were randomly divided by the Technikon Natal Homoeopathic Department pharmacist, dispensing placebo medication to one group of the children and minerals to the other group of children. The first group served as the control group and the second as the treatment group. The subjects of the first two groups were not informed as to which group they were in, until after completion of the study.

Group 3 was made up of children whose parents preferred for them not to take Ritalin. The third group also served as a treatment group for mineral therapy.

3.3 INTERVENTION (MINERAL THERAPY)

Each child in the two experimental groups (Groups 2 and 3) received the following mineral compounds, manufactured by Natura Homoeopathic Laboratory, Hazelwood, Pretoria:

Potassium Phosphate (33 mg) and Magnesium Phosphate (65 mg) in one tablet (PPMP); and
Calcium Phosphate (65 mg), Sodium Phosphate (8 mg) and Iron Phosphate (8 mg) in one tablet (Triphos).

Each of the above tablets had to be taken twice a day with meals.

The control group received placebo tablets, i.e. neutral tablets, identical in appearance and taste, which were taken according to the same instructions given to the experimental groups.

3.4 MEASUREMENT TECHNIQUES

3.4.1 CONNERS' ABBREVIATED TEACHER'S RATING SCALE (Appendix A)

The most widely used scale for evaluating children diagnosed with ADDH is the Conners' Teacher Rating Scale (Conners, 1969). It has been used for nearly three decades in the study of hyperactive children and in treatment studies (Goyette et al.,

1978). Originally it consisted of thirty-nine items, but numerous researchers have made use of a ten-item teacher rating scale, namely the Abbreviated Teacher's Rating Scale, recommended by Conners (1973).

For the purpose of this study, the ten-item subset, standardized by Sprague **et al.** (1974), was used.

Teachers observed the children during a normal day of school activities, without the child being aware of this procedure taking place. Each stipulated activity was rated on a scale from 0 - 3, according to the degree of activity, where 0 is *not at all*, 1 *just a little*, 2 *pretty much* and 3 *very much*.

3.4.2 CHILDREN'S CHECKING TASK (CCT)

(Appendix B)

This task measures sustained attention (Schain, 1978).

The CCT consists of a seven page booklet of single digit numbers arranged in fifteen rows per page with thirteen digits per row. Each new line is identified by a small diagram, and large typing with double spacing between digits and rows is used to avoid possible confusion.

The task was designed to resemble school activities. The child's tasks were to note matches and mismatches between a series of

digits presented auditorily and a nearly identical series of digits presented visually.

The test was confined to 6 pages, so the child would not know precisely when the test would end, thus preventing an 'end effect'.

During the test, digits were called in a random predetermined order on an auditory tape recording, at a rate of one digit per second, in a monotonous voice, without inflection. The voice on the tape recording indicated when a new line was to be presented and when a page was to be turned.

Each page is prepared with 10 audiovisual discrepancies, i.e. the orally presented digit does not match the digit displayed in the book. Each child was instructed to draw a line through each correct digit heard and to circle discrepancies. The CCT reveals two types of errors - omissions (missed signals) and commissions (false signals). The number of times each of these errors were made by each child was added up and the results were compared for differences before and after treatment.

The procedure was demonstrated on the chalkboard and rehearsed in the practice booklet, until the children understood the task.

The task was administered to groups of 4 to 6 children at the same time, initially and on completion of the treatment, thus simulating the classroom environment.

3.4.3 THE FEUERSTEIN TEST

(Appendix C)

Feuerstein used dots, and the way in which children connect them to form figures, to test the degree of impulsivity (Feuerstein et al., 1980).

The child's task was to join the dots, so as to create the figure shown in the example for each set of blocks.

The test consists of 1 page of 20 blocks. The first block, being the example, contains the figure which must be found in the balance of the blocks, and the second block is a practice block.

The procedure was demonstrated on the chalkboard and rehearsed using the practice block, until the children understood the task.

The test was run over a period of 60 seconds, so as to eliminate the inattention component of this test. The child could not complete the entire page in the given time, thus the 'end effect' was eliminated.

By counting the correct figures drawn by each child, the test was scored on two dimensions:

1) Number of blocks completed in 60 seconds.
2) Total score: 1 point for each correct figure.
   0 points for any figure in which an extra dot

was included, a dot missed or too large or too small a figure was drawn.

The test was administered individually and all distractions were minimized.

3.4.4 THE ACTIVITY LEVEL SCALE

(Appendix D)

This is a classroom observation technique (Gittelman, 1980).

Without the child's knowledge his activity level in the classroom was recorded during direct observation. The child was observed during structured instructional class time, because it would be difficult to obtain reliable ratings of behaviour when there were no clear rules governing them. There was also much less variability in what was expected of the child in this formal setting than in an unstructured setting.

Each child was observed for 30 minutes by 2 observers. Each observer worked slowly and systematically through Numbers 1 - 6 on the scale. The procedure was repeated 6 times in the 30 minute period.

Each time the activity which was being observed was distinctively seen, a tick was placed in the relevant space. The ticks were

added and a result obtained for each activity over 30 minutes. Thus a maximum of 6 could be obtained for each activity in severely hyperactive children. The results from the two observers were correlated and the mean score was used for analysis.

3.5 STATISTICS

The numerical data obtained from the various tasks and observation scales were statistically analyzed using the program Statgraphics Plus Version 6, supplied by Manugistics Inc..

The hypotheses were tested using the analysis of variance technique and the least significant difference method of analysis (Bowerman & O'Connell, 1990).

The alpha value of significance was set at 0.05 (Daniel, 1978). The null hypothesis was that there would be no difference between the three groups at the end of the study. If the statistical values were to be greater than 0.01, the null hypothesis would be rejected and the alternative hypothesis, i.e. that a significant difference would exist between the three groups, would be accepted.

The results were analyzed and inference was made as to their significance.

CHAPTER 4

4. THE RESULTS

4.1 INTRODUCTION

Children participating in the study were from Livingstone Primary School, which specializes in learning difficulties and attention problems.

Eighty seven children, each participating for four months, were treated during the two year period of the study. Of these 16 were excluded for the following reasons:

- 2 children changed schools, making the assessments inconsistent.
- 10 children did not take the medicine on a regular basis, as per instructions given.
- 4 children did not take the medicine at all, due to a dislike of the taste of the medicine.

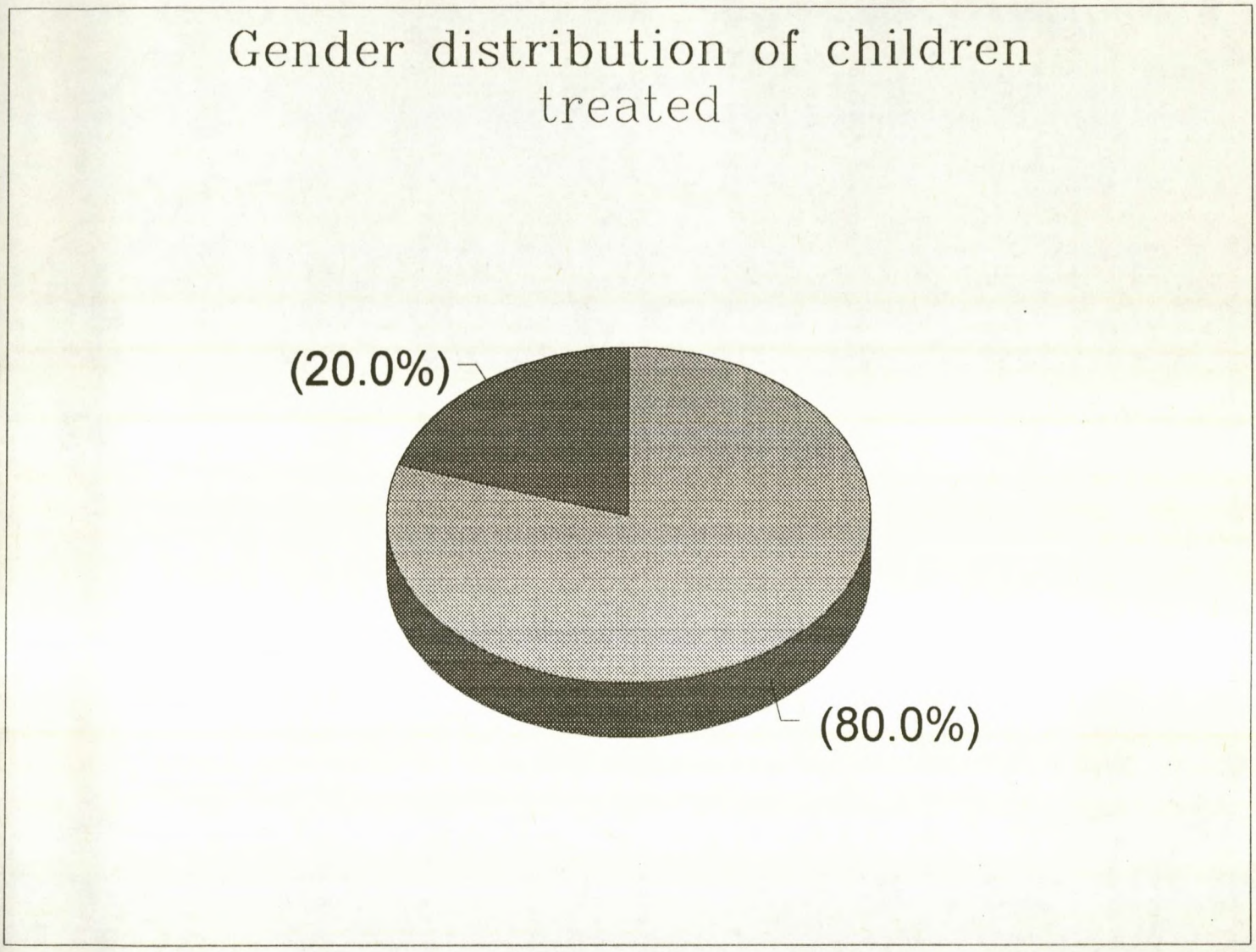
Of the remaining children in each group, 20 were selected according to simple random sampling techniques. Therefore the results in this chapter reflect the treatment of 60 children with 20 in each of the three groups.

4.2 DEMOGRAPHIC DATA

Figure 4.2.1 Graph illustrating the age distribution of the children treated during the study.

At the time of the study, Livingstone Primary School had 174 pupils, 64% of which ranged from age 7 to 9. The sample selected presented a cross-section of the school, as 73% of the children treated were from 7 to 9 years of age.

Figure 4.2.2 Graph illustrating the gender distribution of the children treated during the study.



More boys seem to be affected by this disorder than girls at a ratio of approximately 4:1 (Safer & Allen, 1976; Lambert & Sandoval, 1980). This ratio was reflected by the gender distribution of the children treated and analyzed in the study: 48 boys and 12 girls.

4.3 RAW DATA

Refer to appendices G - J for the raw data relating to the results.

The lower the number of points scored on the tests, the more positive the results were, and vice versa, except for the Feuerstein Test where a higher score indicated an improvement.

The results reflect the mean of the actual scores obtained, not percentages.

4.4 THE CHILDREN'S CHECKING TASK

Table 4.4 Comparison of the mean scores on the Children's Checking Task, between the three groups, before and after the treatment period (n = 20).

GROUP / CCT	INITIAL OMISS *	INITIAL COMMIS *	16 WKS OMISS	16 WKS COMMIS
1. RITALIN & PLACEBO	11.40	11.95	6.65	3.65
2. RITALIN & MINERALS	9.65	11.75	5.15	3.15
3. MINERALS	10.95	12.15	4.80	3.85

* omission = missed signals

* commission = false signals

At a 5% level of significance, the analysis of variance technique revealed no significant difference between the groups before and after the study period. There was a decrease in the scores obtained; however, this decrease was consistent in all the groups.

4.5 THE FEUERSTEIN TEST

Table 4.5 Comparison of the mean scores on the Feuerstein Test between the three groups, before and after the treatment period (n = 20).

GROUP / FEUERSTEIN	INITIAL BLOCKS	INITIAL SCORE	16 WKS BLOCKS	16 WKS SCORE
1. RITALIN & PLACEBO	4.70	6.95	6.50	12.30
2. RITALIN & MINERALS	5.30	7.40	6.25	12.25
3. MINERALS	5.10	8.30	6.05	11.30

Statistical analysis at a 5% level of significance revealed that there was no significant difference between the groups before and after the treatment period when using the analysis of variance technique. Although analysis of the results showed an improvement, this improvement was consistent in all the groups.

4.6 THE ACTIVITY LEVEL SCALE

Table 4.6 Comparison of the mean scores on the Activity Level Scale between the three groups, before and after the treatment period (n = 20).

GROUP / ACTIVITY	INITIAL	16 WKS
1. RITALIN & PLACEBO	15.75	14.20
2. RITALIN & MINERALS	16.22	8.85
3. MINERALS	19.60	9.10

Comparison of the results obtained on the Activity Level Scale, with the analysis of variance technique, revealed a significant difference between the groups at the end of the study ($p < 0.01$), which was not present prior to the study. On further analysis, using the LSD method for pairwise differences, it was found that the greatest difference was between the Ritalin and placebo group and the Ritalin and Mineral Therapy group ($u_1 - u_2 = 5.35$), followed by the Ritalin and placebo group and the Mineral Therapy only group ($u_1 - u_3 = 5.10$).

However, at a 5% level of significance no significant difference was found between the two experimental groups, namely Ritalin and Mineral Therapy and Mineral Therapy only.

4.7 THE CONNERS' ABBREVIATED TEACHER'S RATING SCALE

Table 4.7 Comparison of the mean scores on the Conners' Abbreviated Teacher's Rating Scale, between the three groups during the period of study (n = 20).

GROUP / CONNERS	INITIAL	6 WKS	12 WKS	16 WKS
1. RITALIN & PLACEBO	10.25	10.05	10.15	11.40
2. RITALIN & MINERALS	12.55	9.85	9.00	7.45
3. MINERALS	11.45	11.80	6.20	5.10

Using the analysis of variance technique, all three groups had the same mean initially, but after 16 weeks of treatment there was a significant difference between the groups ($p < 0.01$). The larger differences in means were between the Ritalin and placebo group and the Mineral Therapy only group ($u_1 - u_3 = 6.30$) and the Ritalin and placebo group and the Ritalin and Mineral Therapy group ($u_1 - u_2 = 3.95$), when using the LSD method for pairwise differences.

However, no significant difference was found between the Ritalin and Mineral Therapy group and the Mineral Therapy only group at a 5% level of significance.

CHAPTER 5

5. DISCUSSION

The study was designed to evaluate the efficacy of Mineral Therapy in the treatment of Attention Deficit Disorder with Hyperactivity (ADDH), with regard to inattention, impulsivity and hyperactivity.

The DSM - III R restricts the symptoms of ADDH to three areas: inattention, impulsivity and hyperactivity (American Psychiatric Association, 1987). Each of these was assessed in terms of the respective tests.

Inattention:

The Children's Checking Task evaluated the child's ability to sustain attention over a period of time (Schain, 1978).

It was argued that a decrease in the number of omissions and commissions made on the test following the treatment, when compared with the results prior to treatment, would suggest an improvement in the child's attention span and the efficacy of Mineral Therapy.

There was approximately a 50% improvement in the average attention span of the children, but this improvement was

consistent in all groups (placebo and experimental).

This improvement could be attributed to a number of factors:

- On completion of the final tests, the child was 4 months older than when the initial tests were taken, therefore a certain amount of maturity must be taken into account.

- Repetition. Because of clear demonstrations of how to complete the initial and repeat tests, the child may have had a clearer understanding of what was expected when repeating the test.

- Specialized remedial teaching techniques were being used in the classroom during the study period, which may have reduced disruptive behaviour and increased task orientated behaviour (O'Leary et al., 1976; Ollendick & Cerney, 1981).

Rapport et al. (1987) and Barkley et al. (1988) showed similar improvements in the attention span of ADDH children, using only Methylphenidate Hydrochloride.

Impulsivity:

The Feuerstein Test assessed the child's impulsive behaviour and the extent of changes in the child's ability to delay immediate responses to a stimulus (Feuerstein et al., 1980), before and

after the treatment period.

The results shown in Table 4.5 reflected that in all the groups (experimental and placebo), the number of blocks completed in 60 seconds remained similar, but the points scored increased, therefore the children made fewer mistakes.

Collectively this indicates a more reflective style of thinking, where a child is able to delay immediate response and consider other possible alternatives, as opposed to a more impulsive style, where the child responds with the first possible answer (Kagen, 1966). These results are consistent with those of Tannock et al. (1989), where only Methylphenidate Hydrochloride was used.

However, this decrease in impulsivity was shown to be equal amongst all the groups. This could be attributed to the same factors discussed under inattention.

Hyperactivity:

The Activity Level Scale determined the changes in the motor activity level (Gittelman, 1980) displayed by the child following the use of Mineral Therapy or Placebo for 4 months.

The results presented in Table 4.6 showed a significant difference between the groups ($p < 0.01$), with the Ritalin and placebo group showing a 3.2% decrease in activity and the experimental groups, Ritalin and Mineral Therapy and Mineral

Therapy only, a 15,35% and 21,87% decrease respectively. These results showed a significant decrease in the Attention Deficit child's hyperactivity, on completion of the course of Mineral Therapy.

Overall changes:

The Conners' Abbreviated Teacher's Rating Scale was used to assess the overall changes in the clinical features, presented by a child diagnosed as having ADDH (Conners, 1973).

This scale essentially attempts to quantify all aspects of the hyperactive child's behaviour. Inspection of the rating scale reveals that all the items are directed toward evaluation of the child's attentive abilities by focusing on disturbances that arise from difficulties in sustaining attention (Gittelman, 1986).

The results presented in Table 4.7 showed that there was a significant difference in the results ($p < 0.01$) of the three groups after the treatment. The Ritalin and placebo medication group decreased by 3.83%, whereas the Ritalin and Mineral Therapy group improved by 17% and the group taking only Mineral Therapy improved by 21.16%. Although, an overall improvement was also noted by Abikoff & Gittelman (1985) when using Methylphenidate Hydrochloride.

The findings therefore reveal an overall improvement in the

clinical features of Attention Deficit Disorder with Hyperactivity, which can be strongly attributed to a decrease in the activity level, as shown in Table 4.6. If a child is continuously moving, fidgeting, out of his seat or on the go, he will not be able to complete any of his school tasks and his potential for achieving success at school will be reduced (Campbell & Werry,1986; Schutte, 1988). Consequently if the activity level decreases, the overall clinical features of Attention Deficit Disorder with Hyperactivity will improve.

Ritalin was administered at the school by trained staff members. The Mineral Therapy was administered at home by the parents. However, despite the good results observed, the greatest problem encountered was that of non-compliance with the administration regimen. The parents often forgot to administer the mineral tablets and a number of results had to be disregarded because the medicine had not been taken according to instructions given.

CHAPTER 6

6. CONCLUSIONS AND RECOMMENDATIONS

6.1 CONCLUSIONS

The purpose of the study was to evaluate the efficacy of Mineral Therapy in the treatment of Attention Deficit Disorder with Hyperactivity (ADDH), with regard to inattention, impulsivity, and hyperactivity, in order to demonstrate Mineral Therapy as an alternative to cerebral stimulants, such as Methylphenidate Hydrochloride (Ritalin).

Collectively, all aspects of ADDH, namely inattention, impulsivity and hyperactivity as well as the overall clinical picture of the testees improved, although significant differences were found between the placebo and experimental groups only with regard to the activity level (15,35% and 21,87% respectively) and the overall clinical features (17% and 21,16% respectively).

These findings are consistent with the findings of the Australian Federal Government's Committee of Inquiry into Chiropractic, Osteopathy, Homoeopathy and Naturopathy (1974), in that a substantial improvement was seen in the hyperactive children treated for three and half months with Mineral Therapy, but not in the placebo group.

Research and this study have clearly shown that no adverse effects occur with the Mineral Therapy, as it is non-toxic and non-injurious; side effects and withdrawal symptoms are unknown and it is compatible with and reinforcing to any other form of treatment being used simultaneously (Fisher, 1978; Blackmore Laboratories, 1980).

Therefore, based on the findings of this study, it is concluded that Mineral Therapy has a reinforcing action on children using Ritalin, as a 17% improvement was observed. Moreover, in cases of what was considered to be milder ADDH (i.e. children not using Ritalin), a 21.16% improvement was noted. It is therefore concluded that Mineral Therapy can be considered an alternative treatment to Methylphenidate Hydrochloride (Ritalin).

6.2 RECOMMENDATIONS

Should further studies be carried out in this field, the author recommends that parental perception of the child's behaviour in the evenings be measured, as the cerebral stimulant medication administered during the day is no longer present in the body and the activity seen is an indicator of the Mineral Therapy only.

The taste of the mineral medication should be improved by the manufacturing pharmaceutical company. A number of children disliked the taste of the medication and consequently refused to take it, making the task of administering the medication taxing for parents.

The Mineral Therapy was found to be effective in some cases. However, as no clear distinction in this study was made between mild and more severe cases of ADDH, it is recommended that this be explored in further studies.

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APPENDIX A

CONNER'S ABBREVIATED TEACHER'S RATING SCALE

CHILD'S NAME: _____ **AGE:** _____

DATE READINGS COMMENCED: _____

COMPLETED BY: _____

	Degree of Activity			
	Not at all 0	Just a little 1	Pretty much 2	Very much 3
1. Restless (overactive)				
2. Excitable, impulsive				
3. Disturbs other children				
4. Fails to finish things he/she starts (short attention span)				
5. Fidgeting				
6. Inattentive, distractible				
7. Demands must be met immediately, gets frustrated				
8. Cries				
9. Mood changes quickly				
10. Temper outbursts (explosive and unpredictable behaviour)				
TOTAL				

APPENDIX B:

A SAMPLE PAGE OF THE CHILDREN'S CHECKING TASK

Name:

Date conducted:

7 3 8 8 2 5 7 4 7 6 2 4 6

6 7 3 2 4 7 5 5 8 3 5 4 4

2 3 2 5 6 7 8 0 4 5 3 2 6

7 2 2 4 5 8 8 5 3 6 7 4 7

7 3 8 2 3 4 5 3 2 6 4 4 6

4 8 7 7 0 0 5 3 4 2 0 5 2

2 3 6 7 8 8 4 7 5 3 6 5 5

3 4 4 6 0 7 7 5 8 2 4 4 4

2 5 8 0 3 5 7 5 7 4 3 2 0

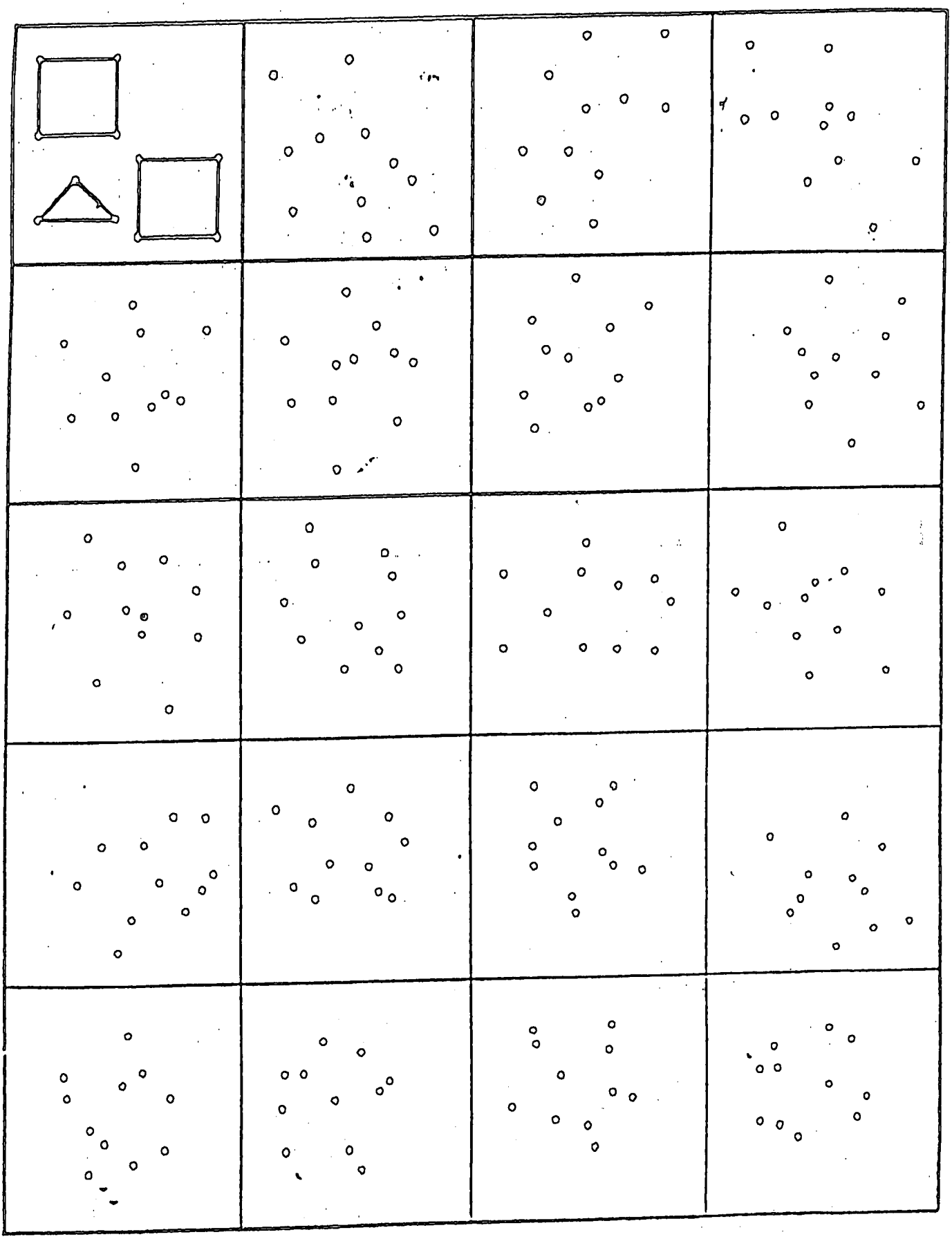
6 6 5 6 4 2 3 8 3 2 5 5 6

3 2 0 4 8 0 8 7 7 5 2 3 4

0 6 4 7 3 3 5 5 2 5 8 0 3

APPENDIX C:

A SAMPLE PAGE OF THE FEUERSTEIN TEST



APPENDIX D

THE ACTIVITY LEVEL SCALE

CHILD'S NAME:

DATE RATINGS COMMENCED:

COMPLETED BY:

Please tick the appropriate block:

1. TALK RELATED: - Excess verbalization that is related to the ongoing task.						
2. TALK UNRELATED: - Verbalizations that are completely unrelated to the ongoing task.						
3. LOWER EXTREMITY MOVEMENT: - Swinging, tapping and shaking of the legs and feet.						
4. UPPER EXTREMITY MOVEMENT: - Shaking hands, playing with hands. - Twirling thumbs, tapping or drumming of fingers.						
5. BODY MOVEMENTS: - Jerky, rocky movements of the whole body. - Changing seating position or posture.						
6. ODD NOISES: - Humming, clicking teeth, whistling during task performance.						
TOTAL						

APPENDIX E

Nadine Muller
74 High Ridge
193 Ridge Rd
Berea
4001

14 September 1993

Natal Education Department
Private Bag 9101
Pietermaritzburg
3200

Att. Head of Educational Psychological Support Services: Mr Webster.
Chief Superintendent of Education: Mr Brownel.

I am a fourth year Homoeopathic student at the Natal Technikon, presently doing research in order to complete my Master's Diploma in Homoeopathy, under the guidance of my supervisor, Mrs Freda Rundell.

My proposed research topic is: The use of Mineral Therapy in the Treatment of Attention Deficit Disorder with Hyperactivity (ADDH).

I require your permission to approach schools in the greater Durban area, namely, Mrs Rulten at Livingston School and Mrs Butt at the Pinetown Senior Primary Remedial Unit, and the parents of children in these schools, in order to obtain permission to treat the required number of children stipulated in my research proposal.

During the duration of my research program, I will be liasoning with the parents and the teachers and selection of children to partake in the study will be done on a volunteer basis only.

The Mineral Therapy which will be used, comprises of a combination of five salts, is non-injurious even when taken over protracted periods and is in no way disruptive to the body's own mineral reserves, in addition to being compatible with any other form of treatment that need to be employed simultaneously.

I intend working with three groups of children, over a period of 4 months, all being previously diagnosed as being Attention Deficit with Hyperactivity. The groups are as follows:

1. Mineral Therapy and Ritalin
2. Placebo and Ritalin
3. Mineral Therapy only

APPENDIX E CONTINUED

(The third group will be made up of children whose parents prefer for them not to take Ritalin).
The children will also be assessed at regular intervals by myself and a remedial teacher or someone equally qualified, in order to evaluate their progress.

In support of my research proposal, I have enclosed for your perusal an extract from the report of the Australian Federal Government's Committee of Inquiry into Chiropractic, Osteopathy, Homoeopathy and Naturopathy, April 1977, with regard to the Naturopathic Treatment of 34 Hyperkinetic Children using Mineral Therapy at the Department of Psychiatry, Austin Hospital Clinical School. As the report specifies "the results show a substantial improvement in the treated group (but not in those who had placebo treatment)".

Your understanding and co-operation would help me enormously with my research and studies and would be very much appreciated.

Yours sincerely

Nadine Muller
(Dip: Homoeopathy)

APPENDIX F

DEPARTEMENT VAN ONDERWYS EN KULTUUR
DEPARTMENT OF EDUCATION AND CULTURE

ADMINISTRASIE: VOLKSRAAD
ADMINISTRATION: HOUSE OF ASSEMBLY

NATALSE ONDERWYSDEPARTEMENT
NATAL EDUCATION DEPARTMENT

Navrae: Mr D V Bromley
Enquiries:
Verw.: 2/12/2/3
Ref.:
Tel.: (0331) 942351
X 343

Natalse Onderwysgebou
Natal Education Building
Privaatsak X9044
Private Bag X9044
Pietermaritzburg 3200

8 October 1993

Ms Nadine Muller
74 High Ridge
193 Ridge Road
Berea
4001

Dear Ms Muller

MASTER'S DIPLOMA IN HOMEOPATHY: RESEARCH PROJECT ON ATTENTION DEFICIT WITH HYPERACTIVITY

Your letter of 14 September 1993 refers.

You may contact the principals of the schools indicated in your letter to discuss your research. As the project involves a health-related matter it is necessary for the conditions indicated below to be satisfied if pupils in NED schools are to take part.

The principal and governing body are to give their permission for a school to become involved.

Further information on the nature and procedures of mineral therapy is to be made available to the principal so that the governing body, parents and medical practitioners concerned can be informed as applicable.

The parents of children involved will need to be fully informed, via the principal, of the nature of the proposed treatment and the procedures involved. It will be necessary for them to give written permission to the school for their children to participate.

In the case of children already under medical treatment the school can only assist if the respective doctors inform the principal in writing that they are agreeable to the further treatment taking place.

Yours sincerely

EXECUTIVE DIRECTOR

APPENDIX G

CONNER'S ABBREVIATED TEACHERS RATING SCALE

GROUP 1 RITALIN AND PLACEBO

CHILD	CONNERS 1	CONNERS 2	CONNERS 3	CONNERS 4
1	12	14	16	14
2	9	9	17	12
3	4	1	3	6
4	16	16	14	14
5	12	9	10	15
6	23	22	21	27
7	13	18	16	12
8	4	2	3	3
9	11	6	8	9
10	14	13	11	15
11	23	10	16	21
12	6	9	7	7
13	6	8	10	11
14	6	3	1	4
15	19	19	21	21
16	2	3	1	1
17	14	19	11	15
18	4	6	2	3
19	4	7	7	10
20	3	7	6	6

GROUP 2 RITALIN AND MINERALS

CHILD	CONNERS 1	CONNERS 2	CONNERS 3	CONNERS 4
1	15	6	13	13
2	17	13	9	7
3	5	14	8	3
4	12	4	4	8
5	18	16	14	18
6	8	12	7	5
7	27	16	14	12
8	17	15	18	12
9	11	9	9	6
10	7	11	5	4
11	3	5	6	3
12	18	8	6	7
13	5	0	0	0
14	9	11	5	5
15	5	2	3	4
16	14	15	20	14
17	11	11	3	4
18	17	11	13	10
19	10	8	7	4
20	22	10	16	10

APPENDIX G CONTINUED

GROUP 3 MINERALS

CHILD	CONNERS 1	CONNERS 2	CONNERS 3	CONNERS 4
1	11	14	10	7
2	10	8	5	5
3	10	22	2	3
4	19	8	9	8
5	12	7	10	12
6	5	1	0	3
7	12	6	6	5
8	9	6	2	3
9	2	2	1	0
10	15	14	11	4
11	8	6	2	1
12	11	10	8	8
13	18	15	6	9
14	11	8	13	8
15	13	4	2	7
16	13	16	8	10
17	9	9	6	0
18	13	3	6	2
19	9	6	5	4
20	19	12	12	4

APPENDIX H

THE CHILDREN'S CHECKING TASK

GROUP 1 RITALIN AND PLACEBO

CHILD	OMISSION 1	COMISSION 1	OMISSION 2	COMISSION 2
1	10	9	0	2
2	12	12	4	1
3	11	13	1	3
4	15	15	10	3
5	12	15	2	2
6	8	7	1	2
7	19	32	0	1
8	9	12	4	2
9	6	8	3	2
10	8	6	6	6
11	10	11	5	3
12	6	16	2	5
13	6	9	10	10
14	35	13	26	8
15	10	7	20	5
16	15	12	2	0
17	16	9	15	5
18	10	13	0	1
19	3	6	20	10
20	7	14	2	2

GROUP 2 RITALIN AND MINERALS

CHILD	OMISSION 1	COMISSION 1	OMISSION 2	COMISSION 2
1	29	12	3	7
2	15	14	1	2
3	7	12	6	2
4	13	11	3	3
5	3	12	5	4
6	4	5	0	0
7	4	7	10	2
8	3	12	3	8
9	6	11	16	4
10	3	10	1	8
11	3	8	0	0
12	23	12	10	2
13	26	16	1	4
14	5	11	2	0
15	9	16	5	3
16	8	14	9	8
17	4	8	7	1
18	0	8	0	2
19	12	22	5	0
20	16	14	16	3

APPENDIX H CONTINUED

GROUP 3 MINERALS

CHILD	OMISSION 1	COMISSION 1	OMISSION 2	COMISSION 2
1	5	15	3	4
2	6	11	10	8
3	8	10	6	2
4	16	11	1	2
5	12	35	15	15
6	8	15	4	1
7	1	7	1	3
8	5	8	4	5
9	17	16	0	0
10	9	9	8	5
11	13	9	9	5
12	15	14	6	1
13	10	6	1	2
14	2	12	4	12
15	10	17	0	0
16	14	15	4	0
17	8	16	1	1
18	5	15	1	4
19	21	13	8	2
20	11	9	7	5

APPENDIX I

THE FEUERSTEIN TEST

GROUP 1 RITALIN AND PLACEBO

CHILD	BLOCKS 1	SCORE 1	BLOCKS 2	SCORES 2
1	7	5	3	7
2	5	8	6	15
3	3	8	6	10
4	4	9	8	11
5	3	7	14	30
6	4	5	5	11
7	4	4	7	13
8	5	13	9	21
9	4	7	6	7
10	6	9	6	12
11	6	8	4	7
12	3	4	5	13
13	10	6	12	14
14	3	6	3	7
15	8	9	6	7
16	3	6	4	9
17	5	6	4	8
18	3	5	7	13
19	5	7	8	14
20	3	7	7	17

GROUP 2 RITALIN AND MINERALS

CHILD	BLOCKS 1	SCORE 1	BLOCKS 2	SCORE 2
1	4	3	3	9
2	4	8	6	12
3	4	6	3	3
4	4	9	6	15
5	7	10	6	10
6	9	19	9	15
7	8	10	9	15
8	4	6	5	11
9	4	6	5	10
10	5	6	6	10
11	3	4	3	8
12	8	9	9	22
13	3	4	4	11
14	4	10	18	23
15	6	8	4	10
16	5	3	6	14
17	6	6	5	9
18	5	8	7	14
19	4	5	5	12
20	9	8	6	12

APPENDIX I CONTINUED

GROUP 3 MINERALS

CHILD	BLOCKS 1	SCORE 1	BLOCKS 2	SCORE 2
1	7	11	6	14
2	10	14	11	19
3	5	9	5	13
4	5	8	5	14
5	5	9	7	8
6	5	11	7	11
7	3	7	6	17
8	8	8	6	15
9	5	8	5	14
10	3	3	3	6
11	5	10	4	7
12	6	8	8	11
13	4	7	5	10
14	5	10	5	10
15	4	4	4	10
16	3	6	3	6
17	4	7	14	6
18	6	7	8	16
19	4	8	5	11
20	5	11	4	8

APPENDIX J

THE ACTIVITY LEVEL SCALE

GROUP 1 RITALIN AND PLACEBO

CHILD	ACTIVITY 1	ACTIVITY 2
1	14.5	13
2	27	24
3	6	3.5
4	22.5	26.5
5	7.5	13.5
6	24.5	27.5
7	19	16
8	10	6.5
9	12.5	12.5
10	12	12
11	20.5	23
12	13.5	6
13	19.5	12.5
14	15.5	12.5
15	34.5	35
16	6	3
17	22.5	17.5
18	6	4
19	10	1.5
20	11.5	14

GROUP 2 RITALIN AND MINERALS

CHILD	ACTIVITY 1	ACTIVITY 2
1	13.5	9
2	20	9.5
3	27	9
4	14.5	6.5
5	18	9.5
6	10.5	8.5
7	25.5	12.5
8	16	6
9	21.5	8
10	11.5	5
11	14.5	12
12	11	10
13	7	3
14	5	5
15	21.5	11.5
16	20.5	16
17	12.5	5.5
18	16	8
19	18.5	13
20	20	9.5

APPENDIX J CONTINUED

GROUP 3 MINERALS

CHILD	ACTIVITY 1	ACTIVITY 2
1	21	17
2	22.5	6
3	12.5	3
4	29	13.5
5	23.5	25
6	8.5	5.5
7	27.5	10.5
8	17	4.5
9	16	7
10	22	3.5
11	23	6.5
12	23	11.5
13	23.5	15.5
14	12.5	8.5
15	21	5
16	12.5	6
17	23	7
18	13	5.5
19	16.5	11
20	24.5	10

APPENDIX K

PARENT CONSENT DOCUMENT

This study evaluates the effectiveness of Mineral Therapy in the treatment of Attention Deficit Disorder with Hyperactivity (ADDH), with regards to Inattention, Impulsivity and Hyperactivity, in order to demonstrate Mineral Therapy as an alternative to cerebral stimulants, such as, Methylphenidate Hydrochloride (Ritalin).

I, the undersigned, as guardian of _____ hereby agreed that my daughter / son may take part in the above mentioned study conducted by Nadine Muller at Technikon Natal. I understand that my daughter / son is in no way obliged to participate and that all information volunteered will be regarded as confidential.

Name (please print) _____

Signature _____

Witness _____

Date _____