THE LOWERMOOR WATER POLLUTION INCIDENT

Report and Discussion Document To Explore Suspected Brain Damage, Endocrinal Dysfunction, Essential Mineral Imbalances and Resultant Homoeostatic Disequilibrium In The Residents of The Lowermoor Water Supply Area, Cornwall

Prepared for

The North Cornwall Homoeopathic Project

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N.B.
This report has never been published in its entirety prior to the COT's Lowermoor Subgroup's 2005 Draft Report. It was felt that to release this prior to an eventual Inquiry would potentially contaminate the collection of future data. As the symptomatology of those affected was corroborated by the COT Subgroup during its own investigations, the time to release this data now seems appropriate. (It should have been included in the Draft Report but was omitted due to an oversight by the Committee's Secretariat.)

Peter Smith, February 2005.

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INTRODUCTION

This document presents the data gathered over nearly four years on people affected by the Camelford Water Pollution Incident who have either received Homoeopathic treatment from, or who have given information to, the North Cornwall Homoeopathic Project (hereafter the NCHP) and the Lowermoor Support Group. We believe that there is an ongoing problem which remains to be fully comprehended. The data presented in this document proffers a hypothesis which we feel bears deeper exploration. This document represents an overview of the situation as gained by our Practice and Support Group contacts, having spent over 950 hours with patients over this last year alone. The NCHP has been involved since September 1988.

The Aim of this Report

1) To provide a backdrop to the whole situation

2) To seek your expertise in your own individual speciality so that a more complete perspective can be gained which could ultimately lead to appropriate help for those still undoubtedly suffering the effects of July 1988's poisoning.

3) To seek serious consideration of the Sensitisation Protocol in Appendix 3. We have experienced countless occasions where people have demonstrated an ongoing sensitivity to the tap water which persists to this day. (See Appendix 3, and further explanation of the background to this).

4) To enable our work and observations to contribute towards a pooling of information with people from all medical spheres so that the best interest of our mutual patients can be obtained.

5) To promote further Conferences such as the initial meeting at Treliske in February 1990, which was most useful. So much more could be learnt if knowledge and information were to be shared between all the different areas of expertise.

6) To promote more detailed inquiry and research into possible benefits of mineral and vitamin supplementation and other topics.

7) To attempt to present our observations as clearly and accurately as possible, having relied on the generosity of those experts who have given freely of their valuable time to explain to us those areas in which we lacked knowledge.

Symptoms

What follows are the elicited and given symptoms from those people interviewed by us. For the full list[1] see Appendix 1. Given time and resources this will be expanded as other data is introduced from other sources (patient notes etc) which we have already collected but due to pressure of work have been unable to collate. The data supplied represents the *minimum* gathered to date and much has still to be added. There are more symptoms to be added to Appendix 1, and the incidences of these (Appendix 2) represents only *half* of those available because much data has still to be gathered, collated and used. However, beyond doubt a general picture emerges.

This total symptom sheet is then artificially separated into 'systems', for ease of comprehension. However, we feel that the totality of the symptoms is more important than particular individual symptoms, as we consider that what we are seeing is the result of the ingestion of complex and highly acidic metal-rich water which caused widespread brain damage. This damage resulted in :

i) hyper-function or hypo-function of the complete system and a disorganisation of endocrinal balances

ii) dislocation and interruption of nerve signals to and from the brain, cellular dysfunction - e.g. sodium/potassium pump, liver and kidney problems.

Homoeostasis has been disordered as a result of damage to the brain. Subsequent re-exposures experienced by patients further weakened their bodies' efforts to reestablish and maintain homoeostasis and this continues to this day.

Some current observations

Nearly four years later fear, anxiety, depression, despair and many, if not all, of the symptoms listed in this report still remain. Even more worrying is that the symptoms show no sign of abating. Newer symptoms continue to emerge which validate the thesis that we are seeing slow, insidious, long term metal poisoning in a sensitised population. These symptoms are repeated whenever the sufferers are exposed to tap water by ingestion or by bathing.

The results of the imbalances of essential elements within the body which caused deficiencies in

[1] Since this report was initiated and released in the form of a draft in time for the London Meeting on December 5th 1991 the symptom picture has been expanded to include some 370 symptoms, the leading 128 of which are attached (See Appendix 2).

the availability of neurotransmitters, is already the subject of investigation by some experts : we consider that cellular dysfunction generally throughout the body resultant from such deficiencies is urgently needed.

The full symptomatology which follows will hopefully help these experts to more fully examine this area.

In addition, the significance of damage to cell structure caused by the lack of proper mineral balance in the body must be a matter of concern. Reference to Appendices 4 and 5 - Hair and Nail Sample data would corroborate this.

EFFECTS ON THE LIMBIC SYSTEM - The core of the problem ?

The damaging effects on the Limbic System caused by the substances ingested in July 1988 appear to have played a large role. This structure within the system is involved in :

a) basic emotional drives - such as anger, fear, sex and hunger,
b) short term memory, (hippocampus)
c) visceral responses to emotions via circuits between the hypothalamus and other parts of the Limbic system.

Experimental and clinical observations have also demonstrated that the frontal and temporal lobes of the cerebral cortex influence lower brain areas as part of their involvement in emotion and personality.

That the limbic system was breached will be elaborated upon shortly.

Observations

We leave it to the relevant experts to *definitively* attribute symptoms, but amongst the many symptoms that we observed were impairment in all those functions which make it possible for people to operate reasonably efficiently in their day-to-day lives, including those functions best described as 'higher', where qualitative judgment is involved, for example. **40% of Males and 30% of Females** reported this out of a group of 30 Males and 40 Females.

Judgment, of course, cuts across mental, emotional and physical bounds, so it is nothing to have people report that they have walked into doorways, fallen off horses, parked their cars very untidily, misjudged responses from their partners leading to altercations, or found it difficult to evaluate business decisions which they would have done with ease and competence prior to the Lowermoor incident.

Money management is a regularly reported difficulty, even down to making change in shops.

Emotional over-sensitivity runs as a very common thread throughout male and female patients. There is a marked loss of emotional resilience. We have observed that there are men of relatively

young age - 45 to 55 - who have been treated successfully for depression but who continue to display tearful reactions to sad occurrences on the News etc which one would normally expect from men many years their senior. This increasing sensitivity does possibly indicate what appears to be an acceleration of the aging process, or perhaps deficiencies which eventually lead older people to begin to display these symptoms. **37% of Males** reported this as opposed to **62% of Females**. This adds weight to our suspicion that we are observing a quasi-acceleration in aging, in that people appear to be developing illnesses in their 30's or 40's that they might reasonably expect to do so in their late 40's to late 50's.

Irascibility is common, with **80% of Males** and **60% of Females** reporting this symptom.

Problems with relationships were also reported by **40% of Males and females.**

The Blood-Brain Barrier and its breaching

Much emphasis has been placed upon the ability of the BBB to protect the brain from damage in circumstances such as occurred in the aftermath of the Lowermoor Incident. However, from studying the structure of the brain one learns that there is a weakness in this barrier in the third ventricle where there are interstitial tissue spaces into which relatively large molecules circulating in the blood can penetrate. This would indicate that there is an absence in this region of the blood-brain barrier. This fact leads one to conclude that the Limbic system was breached, with the resultant problems that we have outlined above.[2]

As is known, the blood brain barrier is only partly formed at birth and is not fully formed until some time after birth, so young children are potentially much more sensitive and therefore are more at risk.

It is known that aluminium, certainly in animal studies, only readily crosses the blood brain barrier if zinc is deficient.[3]

Some further observations regarding the brain

What follows will attempt to demonstrate the relationship between the large number of symptoms collected to date (Appendix 1) and possible malfunction of the various areas of the brain which would under normal circumstances assist in maintaining homoeostasis and other bodily functions. We have attributed the reported symptoms as accurately as possible, but, as mentioned earlier, we rely on the relevant experts to do so definitively. Where relevant, we have added the percentage incidences as earlier mentioned in this report - i.e. Aggressive **M 33% F17%**

THE FORE BRAIN (THE TELENCEPHALON)

The Cerebrum

As is known, the cerebrum is concerned with higher brain functions such as the perception of sensory impulses, the instigation of voluntary movement, the storage of memory, thought

[2] See OVLT page 12

[3] See Zinc Deficiency on page 24 of this report.

processes and reasoning ability. The Cerebrum is also concerned with instinctual and limbic (emotional) functions.

The following particular symptoms observed at Camelford might be thought to fall under this heading:

Aggressive **M 33% F17%**
Anxiety **M53% F67%**
Antisocial, averse to company
Argumentative **M47% F47%**
Awkward relating to strangers
"Black holes"
Company, averse to (see" antisocial" above)
Confidence lacking
Coordination impaired
Concentration, difficult **M 76% F 80%**
Confusion **M 53% F 35%**
Delusion, is persecuted
Depression **M 63% F 62%**
Despair
Dignity lost
Distances, misjudges
Emotion, loss of (zombie)
Exhaustion
Fear
Irresponsible
Irritable Short-tempered
Judgment **M40% (12) F30% (12)**
Learn, ability to impaired
Lonely Isolated
Lost, gets

Memory (weakness for) .....
Day-to-day jobs (business etc)**M73% F50%**
Do, what was about to **M63% F72%**
Done, what has
Events of the day
Expressing oneself **M57% F45%**
Facts details
Happened, what's just
Heard, for what has
Names **M60% F47%**
People
Places
Read, for what has
Said, what has
Say, what about to **M60% F57%**

Spell, how to
Time
Words **M53% F37%**
Write, about to
Write, how to coordination
Written, what has just
Writing numbers

Mistakes
Adding
Names, calls things by wrong
Places, streets
Reading
Speaking **M40% F32%**
Spelling
Where and when you are
Writing
Wrong words, uses
Mood swings, sudden
Motivation, lacks **M57% F 42%**
Obsessed with getting things done
Over-activity of mind
Persecuted, feels
Procrastinates **M 57% F40%**
Reading, fluency affected
Reckless
Relationships, problems with **M40% F40%**
Speak, loss of ability to
Speech slow
Speech slurred
Stuttering / stammering
Suicidal
Suspicious **M24% F27%**
Think, inability to **M53% F57%**
Thinks has said something, hasn't
Thinks is being talked about
Violent
Weepy **M 37% F 62%**

THE LOBES OF THE CEREBRUM

The Frontal Lobe
Having already outlined some of the problems seen, one can now view them with the frontal lobe in mind. Were there any problems with the frontal lobe's function one would expect to see problems with voluntary motor control of skeletal muscles, personality, verbal communication and higher intellectual processes (e.g. concentration, planning, and decision making); also with initiating voluntary motor impulses for the movement of skeletal muscles, with analysing

sensory experiences, and providing responses relating to personality. One would also be looking for problems involving responses related to memory, emotions, reasoning, judgment, planning and verbal communication. Perhaps, after examining the symptoms which follow, the reader will agree that the majority fall within this scope.

(See **Appendix 6** for chart containing these symptoms)

The Parietal Lobe
Impairment of the function of the parietal lobe would lead one to look for problems with somatesthetic interpretation of both cutaneous and muscular sensations as well as problems in the understanding of speech, the formulation of words to express thoughts and emotions, and interpretations of textures and shapes. In addition to expecting problems in actual response to somatesthetic stimuli (as the parietal lobe functions in the understanding of speech), verbal articulation of thoughts and emotions and the interpretation the textures and shapes of objects might indicate problems in this area.

The following particular symptoms observed at Camelford might be thought to fall under this heading:

Difficulty expressing oneself
Cannot remember words
Aching muscles: arms, hands, fingers, legs
Coldness hands, fingers, toes, feet
Cramps in feet, legs
Itching legs
Numbness arms, feet, hands,
Pain, arthritic : ankles, arms, wrists, big toes, middle finger left hand
feet, hands, fingers, hips,
Pain, sore, fingers
knees, legs, leg joints, wrists
Pins and needles, general
Pins and needles : feet
Pins and needles: fingers, left arm
" hands
Spongy, legs feel

The Temporal Lobe
Malfunction of the temporal lobe might go some way towards explaining the problems many people report with short-term memory problems as it is responsible for the storage of memory of auditory and visual experiences and for the interpretation of auditory sensations. It also interprets some sensory experiences. The authors rely on the expertise of those specialising in these areas for more precise evaluation of this.

The following particular symptoms observed at Camelford might be thought to fall under this heading:

Memory (weakness for) .....

Events of the day
Happened, what's just
Heard, for what has
Names
People
Places
Read, for what has
Said, what has
Loss of hearing

The Occipital Lobe
It is understood that this area integrates movements concerned with focussing the eye, correlates visual images with previous visual experiences and other sensory stimuli and gives conscious perception of vision. Compared to other areas of the brain the incidence of problems in this area appear to be fairly limited.

The following particular symptoms observed at Camelford might be thought to fall under this heading:

Blinking, rapid, constant
Blurred vision
Contracted pupils
Deterioration of eyesight
Focussing difficult
Judgment of distance
Light-sensitivity

The Insula
The Insula is thought to be involved with some function of memory; it possibly integrates other cerebral activities, but we know little of the function of the Insula.
We cannot comment any further on this area of the brain.

THE DIENCEPHALON

The Thalamus
The thalamus, as we know, principally acts as a relay centre for all sensory impulses (except smell) to the cerebral cortex. It also performs some sensory interpretation. Unlike the cerebral cortex which discriminates pain and other tactile stimuli, the thalamus responds to general sensory stimuli and provides crude awareness. The thalamus probably plays a role in the initial autonomic response of the body to intense pain and is, therefore, partially responsible for the physiological shock that frequently follows serious trauma.

It has been described as the pain centre of the brain, and its dysfunction may possibly go some way to explaining those pains that are inexplicable by normal examination by those specialists who have seen and examined those affected. Why else, apart from perhaps such areas as Calcium metabolism dysfunction / imbalance, should people be complaining of arthritic pains which on examination of the limbs by highly experienced clinicians produce nothing more than "nothing abnormal discoverable"?

The following particular symptoms observed at Camelford might be thought to fall under this heading:

Headaches
Migraines
Pain in right side of head
Pain, right eye
Sore (eyes)
Pain, general in lungs
Pain in top of lungs
Pain, tenderness, pectoral muscles
Pains, burning, stomach
Cramps in rectum, anal spasm
Pain kidneys
Groin painful (male + female)
Aching neck, back, shoulders
Burning, neck and chest
Pain, shooting, lumbar region
Pain, sore, chest
Stiffness
Aching muscles, arms, hands, fingers,
Pain, arthritic: ankles, arms, wrists, legs, big toes, feet hands, fingers, hips,
Pain, sore, fingers, knees, legs, leg joints, wrists etc

** From this stage, symptoms will no longer be fully attributed, as we considers that those experts reading this paper will rapidly become bored with the obvious being continually pointed out to them.*

The Hypothalamus
The hypothalamus must surely be the at the heart of the matter, as it performs many vital functions, most of which relate directly or indirectly to the regulation of visceral activities, and it also performs emotional and instinctual functions. It performs a role in accelerating or decreasing certain body functions, and it also regulates the release of hormones from the pituitary gland.

Hypothalamic dysfunction
The following principal functions - autonomic and limbic - of the hypothalamus appear to have been disordered:

1) Cardiovascular regulation / the Sodium Potassium Pump : there have been problems with palpitations; circulatory problems have arisen in certain people; blood pressure has been elevated.
Salt-intolerance has been demonstrated, resulting in gross water retention, which can come and go within 24 hours. **(M 7% F 32%)**

2) Body-temperature regulation **:** there have been difficulties maintaining body temperature homoeostasis. We are unsure whether or not this might be indicative of thyroid imbalance.

(M 27% F 27%)

3) Regulation of water and electrolyte balance. We have observed many examples of water retention problems, and of either great thirst / reduced thirst. One would suppose that the Sodium/Potassium pump would again be involved. **(M 7% F 32%)**

4) Regulation of hunger and control of gastrointestinal activity. It regulates glandular secretions and peristaltic movements of the digestive tract. Amongst other symptoms observed, appetite has been altered, hiatus hernia problems (one at least resultant from retching at the onset of the poisoning) and stomach ulcers spring to mind, and there has subsequently been a great reliance on Gaviscon, Zantac etc.
Loss of appetite (M 17% F 17%)
Hiatus hernia (M 10% F 5%) - relatively recently observed symptom, leading us to suspect that our figures may ultimately prove to be under-reported.

5) Regulation of sleeping and wakefulness. These have widely been disturbed; near-narcolepsy in some cases, though this has responded to homoeopathic treatment in many cases, especially where liver-function has been enhanced.
Insomnia (M 33% F 35%)
Sleepiness (M 73% F 42%)

6) Sexual response. It has been rare to find many individuals *not* complaining of lowered libido. Again, this has responded to treatment for the most part.
Libido lowered (M 17% F 7%) * under-reported - emerges usually after several interviews; case-taking is a matter of trust in delicate areas such as this; once established, people will often admit to low libido.

7) Emotions - anger, fear, pain and pleasure. Emotional problems have been widespread, as one would come to expect *where 'limbic homoeostasis' has /had been disturbed.* (See Appendix 2 for details)

8) Control of endocrine functions - stimulation of the anterior and posterior pituitary to release various hormones.

THE EPITHALAMUS

The Pineal Gland

The Pineal secretes Melatonin. The pineal is suspected of controlling sexual function and sexual development by affecting the hypothalamus by stimulating the increase of releasing factors, which in turn affect the secretion of gonadotrophin and ACTH. Presumably, dysfunction of the pineal directly affects libido.

It is recognised that Melatonin causes a lowering of plasma LH levels, and suppresses GH secretion. It induces sleepiness, something we have seen widely in Camelford. Large amounts of Melatonin may cause headaches (commonly seen) and abdominal cramps. As is known,

when administered to depressives, Melatonin increases self-ratings of depression and paradoxically causes increased insomnia. Melatonin levels are said to be low in depressed persons possibly as a reflection of decreased "*adrenergic tone*".

As well as secreting Melatonin which affects the hypothalamus by stimulating the secretion of certain releasing factors, the pineal is **also one of the gateways through the blood brain barrier** and this weakness must be deemed critical for some of the havoc wreaked on the human brain and its functions by the Lowermoor Incident. The *Organum Vasculosum of Lamina Terminalis* (OVLT) is another weak spot in the BBB. It is known in the rat to be the site of oestrogen receptor neurons and may be involved in regulating sexual behaviour in rats, although its functions in humans is less clear. It may explain, if only partially, some of the reasons for lowered libido amongst the sufferers.

Pituitary Gland

We would rely on the expertise of endocrinologists to fully expound on the possible complications which might be expected to arise in this area. However, we feel it necessary to point out those areas we have observed and to pose questions where we are unsure.

Pituitary hormones

1. **GH**

   GH is thought to perhaps promote the movement of amino acids through cell membranes and the utilisation of these substances in protein synthesis.

   Lipo-attraction would make *Lead* uptake a simple matter, also possibly *Copper* but not *Aluminium*[4], unless bound to citrate[5].

2. **TSH**

   It is thought that severe physical stress in humans also probably inhibits TSH release as indicated by the finding that in the "sick euthyroid" syndrome low T_3 and T_4 levels are not accompanied by compensatory elevated TSH levels, as would be predicted from studies of non-stressed individuals. The neural mechanism of stress-induced TSH suppression is not known.

   In Camelford there is no doubt in our minds that there *is* disturbance in thyroid function amongst patients (especially females). It is our contention that the tests employed to date are too crude to give any meaningful interpretation of results. If the technology for this is sufficiently evolved and sensitive to show the fluctuations in the general homoeostatic state, perhaps proper in-depth testing over an adequate timescale should be undertaken, including observations at the menstrual period. "Snapshots" are inadequate and yield data of limited value.

   Other common symptoms of thyroid imbalance such as general slowing down both physically and mentally, falling asleep at the drop of a hat, confusion, memory problems are

[4] This should not be overplayed, because it is simplistic to blame all the problems on Aluminium alone; many other metals were liberated and made bioavailable at the time of the poisoning.

[5] See the section on *Effects of Metal Poisoning* on page 15.

endemic.

3. **ACTH**

Controls the release of hormones from the **Adrenal Cortex.** This secretes corticosteroids which participate in the regulation of mineral balance, energy balance and reproductive function.

i) **The mineralocorticoids**

As is known, they regulate the concentrations of extracellular electrolytes. Aldosterone is the most important of these because it affects the kidneys and regulates the amount of sodium and potassium which are eliminated in urine. It also promotes water reabsorption and reduces urine output. Serious problems are being experienced amongst certain individuals (there being a ratio of 5 women : 1 man) with water retention, which lead us to conclude that the sodium/potassium pump has been placed into a state of disequilibrium, (in women exacerbated at the time of the menstrual period, when perhaps homoeostasis is temporarily disturbed anyway).

ii) **Glucocorticoids**

Influencing the metabolism of carbohydrates, proteins and fats, they also help the body to resist stress, promote vasoconstriction and act as anti-inflammatory compounds. The most abundant and important is Cortisol and, as is recognised, excessive cortisol impairs/inhibits the regeneration of connective tissue, especially when used therapeutically. We wonder whether this would explain problems experienced with muscular aches and pains which appear to be inexplicable on normal clinical examination. Would post mortem examination reveal abnormalities one wonders ?

iii) **Gonadocorticoids**

These affect the sex drive amongst other things.

iv) **Epinephrine and Norepinephrine**

Fight or flight response. Elevates Blood Pressure, increases the rate of ACTH release, increases the efficiency of muscular contraction - perhaps contributing to the muscular contraction/tension/aching felt by many of the population ?

4. **FSH**

There have been widespread menstrual problems, breakthrough bleeding, PMT, menorrhagia, etc.[6]

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[6] **Survey :** Two Camelford women conducted a private survey between Jan 1990 and August 1991 amongst their friends, with the following results :

10 miscarriages were recorded ..... 4 from the same street, 4 from amongst their friends in Camelford, and 2 from neighbouring Delabole.

9 had had previous successful pregnancies. (2 have since successfully passed the 12 week stage of their pregnancies, 1 has given birth since.)

1 was her first pregnancy (she has given birth successfully since).

Also : Of 21 other women who were casually interviewed whilst waiting to collect their children from Camelford C.P. School : all have reported either irregular, heavy or disordered

5. **LH**
   Few problems have been observed in males, other than greatly lowered libido.

6. **Prolactin**
   In Camelford : one known case of milk still being produced 12 months after weaning. Breast-fed for 3 years.

7. **MSH**
   Perhaps one should be looking at the flaring of eczema and psoriasis in the light of a possible imbalance in the levels of MSH ?

8. **Oxytocin**
   We have nothing to comment upon regarding oxytocin save that there have been reports of quite a few spontaneous abortions. Whether oxytocin, which is known to cause contractions of the womb, or other hormonal imbalance might be implicated we leave to others to establish or refute (see footnote 5).

9. **ADH**
   In Camelford, as we have already mentioned, severe water retention has occurred and continues to occur especially in females. This is a relatively recently observed symptom. Oedema has proved very uncomfortable and upsetting for those females (for they are more numerous than the males) who have experienced this. It has occurred in girls and women from the ages of 17 to 45. Elevated Blood Pressure has occurred and responded to Homoeopathic treatment.[7] [8] As Vanadium regulates the sodium/potassium balance, exploring the possibility of establishing Vanadium levels with a view to supplementation may go some way to stabilising those suffering from oedema, and possibly those suffering with raised BP.

   We are advised that such problems with oedema would point to there being quite serious problems with membrane structure. This would indicate problems with Ca, Mg and Zn balances, presumably attributable to the Aluminium, amongst other factors. As far as we are concerned this only adds weight to the validity of the Hair and Nail Sample data and supports our entire hypothesis.

THE MIDBRAIN

The Mesencephalon
Controls among other areas : visual reflexes, auditory reflexes and coordinating reflexes; posture control and movement; it contains many motor fibres.

Menses or cervical erosion. 2 other women from Delabole (not those already mentioned) report the same. This information was passed to Dame Prof. Barbara Clayton's Lowermoor Health Investigation Group.

[7] Would it be useful to monitor the levels of VP (Vasopressin) where BP is raised ? As is known, Acetylcholine stimulation releases vasopressin.

[8] See the endocrine function of the heart on page 14 - link with ANF/oedema

We understand that all these aspects are the subject of investigation and we leave comment on this area to the relevant experts. We recommend that the symptoms be examined in Appendices 1 and 2. We have not extracted them for attribution purposes.

HIND BRAIN
Metencephalon

The Cerebellum has responsibility for balance and motor coordination, whilst the Pons is primarily a relay centre which contains pontine nuclei. As the Metencephalon coordinates skeletal muscle contractions we suspect that there are functional problems within the Metencephalon which may go some way towards explaining some of the muscular problems observed in our patients. Calcium imbalance on a cellular level could also be implicated.

Myelencephalon
Many people report a "fizzing" in the area of the medulla oblongata, and in other areas of the brain, especially parietally and occipitally and up the spine.

Cerebro Spinal Fluid
The homoeostatic consistency of the CSF composition is critical and a chemical imbalance may have marked effects on CNS functions. A slight change in pH may effect respiratory rate and depth for example. We suspect that changes may have occurred to the pH of the CSF at an early stage following the Lowermoor Incident having examined the symptoms. It has been suggested by one specialist that the body's ability to buffer wide swings in pH would have more than compensated for this, but considering that this affair is unique and that the BBB has been breached with such widespread *sequelae,* it might be premature to jump to conventional conclusions.[9]

Thyroid and Parathyroid Glands
As is known, T_4 and T_3 are stored in the thyroid follicles and released as needed to control the metabolic rate of the body. They act to increase the rate of protein synthesis and the rate of energy released from carbohydrates. To judge from peoples' level of energy, it might lead one to suspect that all is not well in this regard. T_4 and T_3 also regulate the rate of growth in young persons and are associated with sexual maturity etc. Perhaps the role of Calcitonin should be examined, especially in the older females, as it functions to regulate calcium levels in the blood by inhibiting the rate of which calcium leaves bone tissue ? Problems have been observed in Camelford in this regard, one elderly lady's hip spontaneously shattered recently. Several of her vertebrae had collapsed during the previous months.[10]

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[9] This brings another aspect into play : we have observed that people born in areas where the water has a higher pH (the chalklands of Kent, for example) reported symptoms of a more severe nature and more acute than their Cornish-born neighbours who possibly naturally have a higher tolerance to acidity in the water supply - at least initially. We are convinced that this relationship between pH and "ethnicity" may not yet be fully understood.

[10] Of course, it is recognised that this is "naturally occurring" in the population. As testing for this is non-invasive, would it not be a simple matter to screen 50 or 100 of the more elderly and a

The Liver and Pancreas
It is recognised that Glucagon stimulates the liver to convert glycogen into glucose which causes the blood glucose level to rise. Conversely insulin has a physiological function opposite to that of Glucagon. It decreases the level of blood sugar. Other functions of insulin are stimulating muscle and liver cells to convert glucose to glycogen, helping amino acids to enter cells and assisting the synthesis of proteins and fats. As mentioned above very low energy levels point to there being liver dysfunction problems present in a very high proportion of those seen.[11] We have observed many of the classic symptoms of liver malfunction in very large numbers of people, from the young through to the very old. These consist of headaches, malaise, fatigue, irritability, increased bruising, the tendency to sleep after a meal and falling asleep at the drop of a hat. Many people have to keep on the move or else they become increasingly lethargic and feel unwell. Perhaps the diabetic people in the local population should be examined to establish whether or not there are any observable differences between them and the rest of the population ?

Adrenal Glands
Should a check be made to establish correct Catecholamine secretion ? Adrenal exhaustion is possibly a consideration.

The Adrenal Cortex secretes corticosteroids which participate in the regulation of mineral balance, energy balance and reproductive function. (See the section on ACTH on page 10). Dysfunction in the adrenal cortex must also be a contributory factor for those with raised blood pressure, one would surmise[12] and be implicated with water retention.

Gonads and other Endocrine Glands
As mentioned in the Survey carried out (see Footnote 5), there have been effects on menstrual cycles and on both female and male sex drive. The importance of this in comparison to other major aspects of the problem may be to a certain extent less important. It is perhaps rather more functional. We have observed that as the energy increases and people improve, following homoeopathic treatment, libido and menses return to normal in many cases.

The Lymphatic System
It is recognised that the principal function of the thymus is associated with the lymphatic system in maintaining body immunity through the maturation and discharge of T-cell lymphocytes.

The thymus also secretes thymosin which is believed to stimulate T-cells after they leave the thymus. Should the other endocrine glands prove to be affected, it follows that one would expect

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sufficient number of recently-menopausal women to compare people against control norms in the general population ?

[11] Simple herbal drainage, detoxification and stimulation of the liver promptly improves the situation, which confirms the validity of a diagnosis of liver impairment.

[12] Recently, one patient post-operatively received the usual glucose drip in *saline*, with worrying effects. Gross arrhythmia, the chest visibly jumping etc. ensued, settling only after the specialist handling the case wisely listened to the patient's explanation that sodium intolerance was a common symptom amongst those affected by the Lowermoor Incident.

to find a corresponding malfunction in the Thymus. This would result in either over-or under-production of T-cells, which could result in serious effects on lymphatic system function, and could lead to lowered immunity and *reduced healing ability*, a ***very*** common symptom in Camelford.[13] It is recognised that if there is inadequate lymphatic drainage this can result in oedema which is widely reported.

The Stomach, Small Intestine and Colon - damage to cell function ?

To consider briefly the symptoms reported from the high level of complaints of acidity (some short-term, some long-term) it is not a great leap to suspect that Gastrin production must have been elevated, perhaps in an effort to repair the gastric mucosa damaged by the initial ingestion. From the number of people taking Gaviscon, Zantac and other medications, elevated acid levels are fairly widespread. Nearly four years later certain people can still not tolerate such things as oranges; diarrhoea follows very rapidly.

As proof that the problem of sensitisation persists, there is one woman who will develop stomach and abdominal pain, resulting in diarrhoea and vomiting within 30 minutes or less of drinking the tap water again. Many others will re-experience many of their initial symptoms, especially the exhaustion, aching and lethargy. These can last for from as few as 2 days to as many as 14 days.[14]

That there has been long-term damage to the intestinal mucosa as a result of sulphate ingestion seems evident. Since the sulphate has such an astringent effect, perhaps the ability of the cells of the colon to extract water from the faeces has been impaired permanently.[15] It has been suggested to us by experts that the cells are behaving aberrantly, due to faulty cell reproduction as a result of there either not being the correct materials available for the body to create perfectly functioning cells or other substances displacing those normally available in the process. It is known that, for example, Aluminium follows the path of Iron and Calcium and is more readily 'fixed' in cells, thereby displacing Iron and Calcium amongst other substances. Thereafter the cell function is disturbed; the critical role played by Calcium in cell structure and behaviour is well recognised.

Faulty metabolism and malabsorption could indicate that cell reproduction is disordered. Is it possible that by the injection of supplements one could bypass gastrointestinal absorbency malfunction and thereby make those minerals available for the body to *then* recreate normal cells ?

Symptoms observed/reported

Acidity

Cramps in stomach

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[13] Many people take much longer to recover from infections, requiring up to 4 or 5 Rx's of antibiotics to clear an infection (where a single prescription or two at most would have done the job in the past). Cuts, strains and bruises heal very slowly.

[14] See *Report on Homoeopathic Project in North Cornwall* and *Lowermoor : Some Observations. Smith and Davidson* . Sensitisation is more fully discussed in this paper.

[15] We have been unable to find data to expand on this hypothesis but we wonder what else would explain persistent diarrhoea in people nearly four years after the event. With others, perhaps this function is too effective, which results in constipation ?

Discomfort, eating after
Diarrhoea
Easily sated
Hiatus hernia
Generalised indigestion
Loss of appetite
Nausea
Pain(s)
Burning pains, stomach
Quivering / fluttering, stomach
Sickness/vomiting
Stomach ulcers
Swelling of abdomen
Thirst

The Placenta

The placenta being an endocrine gland secretes large amounts of oestrogens and progesterone as well as a number of polypeptide and protein hormones which are similar to some hormones secreted by the anterior pituitary gland. We have no data on placental function but perhaps the incidence of 10 known abortions in the early months of pregnancy might lead one to expect that the placenta is functioning far from at its optimum in the Camelford population. We are informed that a spontaneous abortion rate of 15-20% is to be regularly seen in the population as a whole and one wonders whether the Lowermoor supply area is seeing anything other than this. (The 10 cases reported are from within the town and within a small social group, suggesting that there may well be others that either go unreported to friends and relations or even to their G.P.s.).(See footnote 5.)

Endocrine Function of the Heart

The important role of the endocrine function of the heart bears investigation. The role of atrial natriuretic factor (ANF) in the regulation of not only blood pressure volume but also the excretion of water, sodium and potassium is axiomatic. As has been pointed out, we are seeing generalised and sudden oedema and also BP's which vacillate from anything like 185/84, 180/110, 250/110, 200/90, 240/120 to 227/127 in one 69 year-old female. ANF is suspected of playing a role in either the entry of calcium into the cells or its relocation within the cells; it has been shown to inhibit second-messenger enzymes such as adenylate cyclase; to inhibit vasopressin production and to effect ocular pressure.[16] We would recommend that any possible

[16] Marc Cantin and Jacques Genest, 1986. Chapter 1 - The Heart as an Endocrine Gland pp 3-11. Readings from Scientific American - Cell Communication in Health and Disease. Ed. Howard Rasmussen

tests be carried out to investigate this very complicated homoeostatic loop especially where serious elevation of BP is occurring. The premise of this paper is that there *is* homoeostatic disruption of the system.

General observations on endocrine dysfunction

We wonder whether any valuable endocrinal data is recoverable from post mortems ? During our investigations we have been regularly informed that either the information we require is unavailable because its complexities have yet to be unravelled, or that it would be too expensive to gather.

Stress

Efforts have been made to misapportion stress to pure media-induced stress. On the contrary, we consider that the stress emanates from varying quarters, internal and external :

1 The actual physiological stress caused by the Aluminium Sulphate-rich water.

2 We consider that endocrinal homoeostasis has been impaired as a result of the malfunction of, amongst other areas of the brain, the Limbic System. This in itself would place great stress upon victims who found themselves reacting in an uncharacteristic and involuntary fashion. This idea is supported by the behaviour of the animals, whose stress cannot be laid at the door of the media. (See work published on pigs by Dr Neil Ward, Department of Chemistry, University of Surrey).

3 People believed what they had been told by the Area Health Authority

4 Stress caused by denial of the existence of the problem when many of the patients reported their genuine symptoms in all good faith. To this day, most of the doctors in the area still do not admit that there is a problem. Many people still cannot discuss 'the water problem' with their doctors, as their antipathy is well-known. People still feel unsupported.

5 Stress caused by the absence of speedy and knowledgeable treatment of their symptoms.

6 Lack of support by friends, family and the community.

Most importantly, many people from several communities such as Rock and Polzeath were unaware that they actually even received their water supplies from the Lowermoor Water Treatment Works. It is our suspicion that there are still people who have been affected who are still unaware that they are receiving Lowermoor water. One small community was actually switched over to Lowermoor water supply in the summer of 1989, and did not learn about this until October 1990.

Aluminium and the role of the other metals ingested

Many investigators are convinced that the Clayton Committee placed altogether too much emphasis on the role of Aluminium alone in the course of preparing its papers. The role of Iron, Copper, Lead and to a lesser extent Zinc must be addressed. Simple reference to basic textbooks on metal poisonings reveals information which should have set off alarm bells for the Clayton Committee.

It would appear that the Committee chose to ignore the symptomatology which we had supplied as early as February 1990 (albeit in the form of homoeopathic data) and which could have been compared with scientifically accepted and acknowledged symptomatology of metal poisoning. Instead the Committee appears to have put its energy into pulling apart the data supplied by other scientific contributors.

Symptoms of Metal Poisoning

For the record, the NCHP lists the basic symptoms associated with metal poisonings, without exploring the matter at great depth. One has only to cast one's eye over the main body of symptoms collected by the NCHP to see where these two overlap.

Metal	**Symptoms**
Lead	nausea
	vomiting
	abdominal colic
	hypotension
	paraesthesia
	muscle pains
	renal and hepatic damage
	peripheral neuropathy
	memory problems etc

The problems caused by Lead in brain function are already well documented, and a speciality of Professor Clayton. It is perplexing that she, with the experience that she has in the field of lead, should have overlooked this as a possibility.

Iron	epigastric pain
	nausea
	vomiting
	headache
	pulmonary oedema
	metabolic acidosis
	acute (?chronic) renal failure etc
	fatigue
	dizziness
	shortness of breath

Iron is also known to damage the heart, liver and pancreas. Arthritic patients are known to insufficiently metabolise iron.

Copper	acute gastroenteritis
	renal failure
	cirrhosis of the liver
	hypertension
	depression
	premenstrual tension
	hyperactivity of children
	senility
	functional hypoglycemia
	In rats, the adrenal enlarges, resulting in stress

The use of Copper sulphate as a method of inducing emesis is no longer recommended as it is known to carry a risk of absorption of toxic amounts of copper. One wonders just how great a

concentration of Copper was necessary to have bleached hair green and how much greater and more drastic was the effect of ingesting such contaminated water.

Zinc	fever
	nausea
	vomiting
	muscular aches
	chills
	diarrhoea
	lethargy
	stiffness
	acute pancreatitis
	acute renal failure

Mineral and trace element imbalances

We feel that the data gathered from the Hair and Nail samples analysed by Dr Neil Ward at the University of Surrey (see Appendix 4), demonstrates beyond doubt the fact that there was and continues to be an ongoing problem with mineral imbalance in many, if not all, of the people living in the community. Other samples gathered by Drs Richard Newman and Christopher Jarvis are doubtless available on request. Other testing has been carried out at Biolab Medical Unit, London. For a simple analysis of the results of these samples, see Appendix 5

1) Calcium

We suspect that there are problems with calcium metabolism and calcium levels in the body. The calcium has been displaced by the metals, and this must go some way to explaining some of the problems which appear to be occurring in the realm of intra- and inter-cellular communication;
messages do not appear to be getting through correctly, (especially bladder but also some anal sphincter control has been disrupted in many people, just to quote one example) pointing to problems with synaptic transmission in which calcium has long been known to play an essential link. The effects of calcium deficiency are depression, irritability, impaired memory and calf cramps.

2) Zinc

As can be seen from the results of the Hair and Nail Sample results, the figures for both showed almost identical results. The role played by zinc in healing is well-known and many allergic states are found to have zinc-deficiency at their roots. A very high proportion of people report a drastically lowered healing capacity. As has already been mentioned additional doses of antibiotics are commonly required to clear infections which would have normally responded to a course of one or two prescriptions. Cuts routinely take much longer to heal, as do bruises.

Hambridge et al, 1972 observed that children deficient in zinc displayed poor growth. Out of the 21 children treated by the NCHP 2-3 immediately spring to mind as children that one would not describe under any circumstances as 'flourishing'.

Professor Derek Bryce-Smith has mentioned that it has been observed that Zinc is critical in preventing Aluminium crossing the BBB. Taking this into account, together with our Hair and Nail Sample data, we feel that this is an area of concern.

3) Selenium

The Selenium levels in the Hair and Nail Samples must surely have a certain statistical significance. It is not within our area of expertise to comment upon the significance of the figures. However, its toxicity leads to hair loss and nail loss and these are commonly symptoms.

There are doubtless experts who can evaluate the 370 symptoms in Appendix 1 and attribute these more effectively to mineral imbalance than ourselves.

Chelation

A recent chelation by St Thomas' Hospital, London, using EDTA, on 10 Camelford patients has apparently helped at least half of those treated. Weiner mentions that repeated chelations were necessary in Alzheimer patients (over 20 in some cases).

Vitamin C is a good natural chelator but EDTA could be beneficial where people display a Vitamin C intolerance, e.g. such as those with persistent gastric/colonic problems as a result of the sulphate ingestion.

We have identified a specific course of Homoeopathic remedies which would perhaps help approximately 60 - 70% of people in the community, giving significant initial relief.

Recommendations

We re-emphasise those recommendations made in our two reports to the Clayton Committee, as well as making others in the light of newer discoveries. Reference to these earlier reports are advised to place things in context :-

1) **Sensitisation**

Steps must be taken to establish or refute this.

2) **Epidemiological Survey and Post mortems**

Even nearly 4 years after the incident data can still be gathered. It should still be gathered, irrespective of the fact that data could be 'contaminated'. We have raised the question of Post Mortems many times. Distressing as this might be, unless the community is formally asked to cooperate with this, much useful data must be being lost. Simple 'flagging' of Doctors' and hospital records is surely far from sufficient ? The monitoring of births, deaths, stillbirths, birth defects etc. is also necessary. A central register should be established in conjunction with Doctors' surgeries, specialists and the local AHA to monitor the development of particular problems as trends emerge - as they have done.

Dr Richard Newman performed a simple survey on memory problems in two different surgeries - one in the Lowermoor Water Supply area, one outside - with quite interesting results. Many equally simple exercises such as this would doubtless yield further useful data. It would be a simple matter to coordinate this and the different surgeries could cooperate and pool information with very little effort. Funding should be made available to facilitate this.

3) Assessment of Richmond Test results in the schools

We have been able to discover very little about the results of these but they would seem to offer a very reliable evaluation of the performance of the schoolchildren as there must be millions of such tests on file with which to compare them with the performance of children in similar rural communities.

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APPENDIX 1.

The Full Symptomatology

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370 symptoms

As at 8 May 1992

Other data remains to be added to this, so therefore the incidences recorded in this appendix represent a minimum of all incidences.

APPENDIX 2.

The Leading 128 Symptoms

Separated into Males and Females with % Incidences

APPENDIX 3.

Sensitisation Protocol

With introduction and discussion; also, suggestions by various experts

Introduction

The existence of sensitivity to the tap water amongst (certain of) the population resident in the Lowermoor Water Supply Area is beyond doubt. The problem, as with the whole of the Lowermoor Incident, is to actually prove it.

This protocol has been in existence in various drafts since December 1990, and despite efforts to enlist help from Professor Clayton's Committee and the local Area Health Authority it remains unimplemented. When approached, South West Water was obviously extremely reluctant for such a problem to come to light, and therefore even discussion of the topic of research was not on the table. One can understand the reluctance of the Government to hear of a problem, as privatisation of the Water Companies was its main objective at the time of the incident. After all, large sums of money to remedy the situation nationally, plus claims for compensation by those damaged, were and continue to remain at stake.

The local Health Authority received the results of an evaluation of the enclosed protocol by an expert it appointed in February 1992. In spite of the fact that I had requested help from experts to refine the protocol to the point that it could be implemented, the focus of this report remained, typically unhelpful, with perhaps the most amazing, if not downright spurious reason being given for not being able to run any such protocol :

' Since Aluminium Sulphate is regularly added in low doses to tap water in the U.K., it is not possible to establish a control group which has not been subjected to aluminium in their tap water. The possibility exists that people from other areas may have been sensitised to aluminium.'

Dr Phillipson's inference is that the whole population may to greater or lesser degrees be sensitive to aluminium, which begs the following questions :

i) as a government expert, is the author of the evaluation report Dr Phillipson not concerned about the health of the nation being at risk, when making such a comment ?

ii) why has the Department of Health not picked up on Dr Phillipson's point ? Surely its role is to act as the watchdogs of Public Health ? What are the long-term health ramifications of introducing aluminium into the water supply, especially in water which is highly acidic ?

iii) why has the thrust of the protocol been so completely ignored ? What are the real motives ?

Yet again, as is so often the case, the emphasis is wrongly placed on aluminium alone, whereas the point of the protocol is to establish a sensitivity to the local water, in the aftermath of a cocktail of various metals in a highly acidic solution to which we believe so many people are reactive. It is a question of copper, lead, iron and aluminium. It is puzzling why this point is missed by so many people.

The protocol itself has been omitted here (February 2005)

APPENDIX 4.

Extracts and Commentary on data of Results of Hair and Nail Sample Tests carried out by Dr Neil Ward, Department of Chemistry, University of Surrey for the NCHP.

Introduction

The data in this Appendix is in a raw state.

As there is a certain amount of urgency in delivering this report and the much of the Hair and Nail Sample data has only recently been completed by Dr Neil Ward, it is necessary to restrict ourselves to a simple presentation of the data as far as we have been able to study it. Having said this, there does appear to be a general pattern emerging.

To definitively interpret the results we must rely on the expertise of more senior colleagues in other disciplines but in the meantime we will offer various hypotheses to initiate discussion.

The Samples

We have three distinct sets of samples, with a fourth in the pipeline :-

1) Hair Samples - July 1989 to Dec 1990

2) Nail Samples - ditto

3) Hair samples - Dec 1990 to May 1991

The fourth set of samples represents Nail Samples for the latter period.

We have a further set of Hair Samples, numbering 160 and a similar number of Nail Samples which but for a lack of resources would also have been processed by now. These reflect the position from May 1991 to May 1992. We feel that completing this final set of tests is a matter of some priority, as a failure to do so would result in much potentially useful information going by the board. Funding to facilitate this must be sought. Suggestions are welcomed.

The NCHP and others gratefully acknowledge the generosity of Dr Ward in having carried out the extensive testing of samples to date.

Further to these samples, there exist other samples taken by G.P.'s - also tested by Dr Ward - some of the results of which are included in this data. These are invaluable, because they constitute the earliest samples taken and will provide two sorts of differential and corroborative data :-

i) by extending the time period of sampling and by including other data - blood etc which the NCHP was unable to undertake

ii) a crude form of control : many of these people have been treated by the NCHP, and have been subsequently re-tested : some have been treated conventionally only.

Salient features and observations

Reference to Appendix 5 - Chart 1 - will be useful at this juncture.

HAIR

Cu Raised Cu values appear to be normalising. Where there were 89 % of all samples either at least 50% above norms (43%) or merely raised (46%), these have fallen to 6% and 29% respectively, a total of only 35%.

Al There has been a shift of 9% downward from the highest level to the medium, and the level of normal has risen 2%. The levels of these continue to be significantly raised, however : seriously raised 68%, above normal 16%, with only 16% testing within normal ranges. None are testing below.

Se Selenium levels continue to fall, with the level of normal levels dropping from 42% to a mere 27%, the level of lowered samples rising to 71% from 52%.

Fe Levels of these have risen to the point where there are none testing below. Levels of seriously raised levels have dropped from 31% to 8%, whilst simple raised levels have correspondingly risen.

Ca The normal range of Calcium levels has more than doubled from 26% to 56%. Where those testing below was 63%, this has gratifyingly decreased to 12%. There has been a corresponding change from normal to above normal of 21%, raising the former level from 5% to 26%. The level of seriously raised samples has risen by 1% to 6%.

Zn Whilst the numbers of those testing normally has risen 50%, this still remains a paltry 18%, and seems to reflect a fall in raised and above normal levels. The underlying trend of 81% testing below must surely be significant.

Pb No samples give normal or below normal values. Instead there has been a sharp increase, seriously raised levels rising from 65% to 88% and leaving a mere 12% above normal. 100% are testing above normal and seriously above normal.

NAILS

Cu As can be seen, fully 100% of nails sampled gave above normal readings, split 86% seriously raised and 14% above normal ranges.

Al 100% gave results of at least 50% above control norms.

Se There was an interestingly high level in nails as opposed to a low level in hair samples.

Fe In a straight ratio of very high and raised levels to normal and lowered levels hair samples gave a ratio of 13:12, whilst nails gave a ratio of 3:1.

Ca Similarly, taking ratios into account, with hair samples the significant ratio here was between normal and lowered levels of roughly 2:5, whilst in nails it was again 1:1.

Zn The levels of Zn in nails mirrored precisely that found in the hair samples, bar minor deviations in the higher levels.

Pb A 7% increase in the higher level of nail samples compared to those found in hair samples, but the trends demonstrate a marked similarity with hair samples.

Possible interpretations

When examining these results of a totally unique water pollution incident we are both hindered and at the same time unhampered. Hindered because we do not have similar situations with which to compare results, unhampered precisely because it allows us to view the results from a fresh perspective.

There are various basic possible interpretations one can make :-

i) high levels in the hair and nails denote present high levels in the body as a whole

ii) high levels in the hair and nails denote previous high levels in the body as a whole

iii) low levels in the hair and nails denote present deficiencies in the body as a whole

iv) low levels in the hair and nails denote past deficiencies in the body as a whole

v) high levels in the hair and nails denote that the body has been able to transfer the substances involved into 'safer' tissue such as hair and nail - Pb, Al, Fe and Cu

APPENDIX 5.

Simple analysis of results of data in Appendix 4

APPENDIX 6.

Symptoms suggested as indicative of Frontal Lobe dysfunction

See page 7

APPENDIX 7

Male / Female - numbers
