Gut and Psychology Syndrome

Natural treatment for

Dr. Natasha Campbell-McBride MD,
MMedSci(neurology), MMedSci(nutrition)

Dr. Natasha Campbell-McBride set up The Cambridge Nutrition Clinic in 1998. As a parent of a child diagnosed with learning disabilities, she was acutely aware of the difficulties facing other parents like her, and she has devoted much of her time to helping these families. She realised that nutrition played a critical role in helping children and adults to overcome their disabilities, and has pioneered the use of probiotics in this field.

Her willingness to share her knowledge has resulted in her contributing to many publications, as well as presenting at numerous seminars and conferences on the subjects of learning disabilities and digestive disorders. This book captures her experience and knowledge, incorporating her most recent work.

She believes that the link between learning disabilities, the food and drink that we take, and the condition of our digestive system is absolute, and the results of her work have supported her position on this subject. In her clinic, parents discuss all aspects of their child's condition, confident in the knowledge that they are not only talking to a professional but to a parent who has lived their experience. Her deep understanding of the challenges they face, puts her advice in a class of it's own.

Natasha Campbell-McBride holds a Degree in Medicine and Postgraduate Degrees in both Neurology and Human Nutrition. In her clinic in Cambridge she specialises in Nutrition for Children and Adults with Behavioural and learning Disabilities, and Adults with Digestive and Immune System Disorders

Dr Natasha Campbell-McBride is to be congratulated on putting together such a well-researched and provocative book. I warmly recommend it.
Dr Basant KPuri, Consultant Psychiatrist, Imperial College, London, UK

Dr Campbell-McBride has done an excellent job of summarising the nutritional biochemical connections with psychiatric and neurological disorders and gastrointestinal function. The book is full of valuable and interesting facts that can be used by people to optimise the health of themselves and their children.
Dr. William Shaw, Ph.D., Great Plains Laboratories, Kansas, USA

The book contains basic information for the beginner as well as in-depth information for those at an advance level. Thank you Dr Campbell-McBride for writing this book.
Dr. Stephen M. Edelson, Ph.D., Centre for the Study of Autism, Oregon, USA

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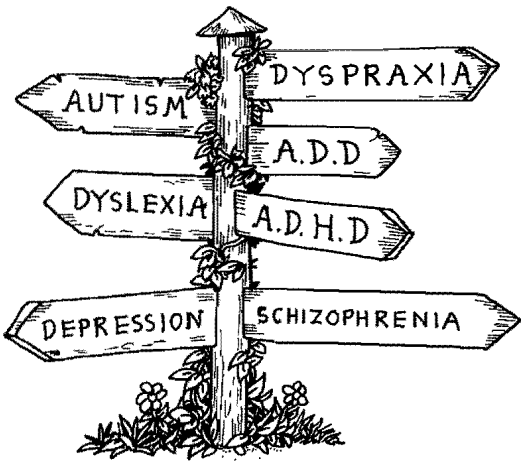

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To my sons, Nicholas and Matthew, and to my husband, Peter, without whose support and encouragement this book would never have been written.

REVIEWS

Dr. Natasha Campbell-McBride is to be congratulated on putting together such a well-researched and provocative book. From the over-use of antibiotics to the promotion of breast-feeding and healthier diets, Dr. Campbell-McBride writes with the authority of a practising doctor and with the warmth and feeling of a mother of a child with autism. Every parent with a child who has autism, attention-deficit hyperactivity disorder, dyslexia or dyspraxia will find much to value in this book, which in turn delights and shocks the reader. I warmly recommend it.

Dr Basant K Puri,MA, PhD, MB, BChir, BSc MathSci, MRCPsych, DipStat, MMath, Head of the Lipid Neuroscience Group, MRI Unit, Hammersmith Hospital, Imperial College, London; and author of the books The Natural Way to Beat Depression; Chronic Fatigue Syndrome; and Natural Energy.

Dr. Natasha Campbell-McBride has done an excellent job of summarising the nutritional biochemical connections with pyschiatric and neurological disorders and gastrointestinal function. She has done an admirable job in relating specific digestive disorders in conditions such as schizophrenia, autism, attention deficit disorder and other problems of child development. The book is full of valuable and interesting facts that can be used by people to optimise the health of themselves and their children.

Dr. William Shaw, PhD., Great Plains Laboratories, Kansas, USA

Dr. Campbell-McBride's book provides important information and great insight into the understanding and treatment of gastrointestinal disorders in those with developmental disabilities and other disorders. The book contains basic information for the beginner as well as in-depth information for those at an advance level. Thank you Dr. Campbell-McBride for writing this book.

Dr. Stephen M. Edelson, Ph.D., Center for the Study of Autism, Oregon USA.

This book is fantastic and will become a classic. Every medic should have one.... No, every household should have one!

An invaluable resource for patients with 'syndrome diseases' and so-called 'mental health problems'. The medicine of the future already in practice.

Martina Watts BA(Hons) DipION MBANT,
practising nutritionist and journalist

This book presents the case for investigating the nutritional aspects, how the gut works and how poor gut function seriously impacts not only physical health but also brain function, for all children with learning and behaviour difficulties.

Countless parents seeking help from The Hyperactive Children's Support Group find their children benefit greatly from dietary and nutritional interventions. Vitamin, mineral and essential fatty acid deficiencies are all too frequently discovered.

This book offers an insight to how the digestive system affects the brain.

Sally Bunday, Founder Director,
The Hyperactive Children's Support Group, UK

WICKEN FEN

The old wooden gates swinging wide open
leaving room for a path of wood stretching out in front of you.
The heavenly scent of the clean fresh air.
The whistling sound of the grass and the trees
swaying left and right in the breeze.
At night you stare at the wonderful sight.

The path leading over the moist soft grass.
You walk on the bridge over a gently flowing river.
The hill reaching so high, almost touching the sky.
The windmill still stands as you walk the stairs
which have been there for years.

The buzzing of the bees busy in their hive.
All the sounds surround you.
The warm feeling of welcome is quick to arrive.
The sun shining bright on the grass
as green as the leaves in summer.

The way forward getting thinner leaving the feeling that lasts.
The adventure is over.
Feeling warm inside.
Farewell until next time.

Nicholas Campbell-McBride, 11 years old,
Cambridge, UK

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To THE PARENTS OF AUTISTIC CHILDREN - AN OPEN LETTER

Not many people would choose to become parents of an autistic child. Yet it is happening to more and more of us in our modern world. There is an unmistakable epidemic of autism going on across the globe. If this can possibly be of any comfort for a parent, then I would say that you are certainly not alone!

Autism used to be a rare disorder, so that the majority of doctors never saw it in their practice and most people had never heard of it. Fifteen years ago in western countries the incidence of autism used to be on average one child in 10,000. Now according to the UK Department of Health 1 in 166 children in Great Britain are diagnosed with autism. According to the USA Centre for Disease Control (CDC around 1 out of 150 American children are diagnosed with autistic spectrum disorders now and the numbers are growing every day. Similar numbers are reported by the Autism Canada Foundation. A Finnish study published in the *European Journal of Child and Adolescent Psychiatry* (2001, volume 9) reported an incidence rate of 1 child in 483 diagnosed autistic in Finland. In Sweden a rate of 1 child in 141 was reported.

So, what is happening? Why do we have such a dramatic increase in numbers of children falling prey to this terrible disorder, deemed incurable by orthodox medicine?

Is the reason for this epidemic genetic? The truth is - we don't know! However, what we do know, is that genetic disorders do not show such a sudden increase in incidence. Genetics just don't work that way. This kind of increase in new diagnosis of autism cannot be explained by genetics. On the contrary, it provides a strong argument to support the statement, that genetics may not play an important part in the development of autism after all.

Is this epidemic due to better diagnosis? That is what some very well-established British medical experts are trying to tell us. So, in effect are they saying that 10 years ago doctors in the UK were so bad at recognising and diagnosing autism

case, where are all these children today? They would by now be teenagers

with autism, because we know that this disorder does not disappear with age. We clearly do not have 1 in 166 teenagers in the UK with autism. So, this argument does not convince anybody. Something else is going on. Something that cannot simply be explained away and something that cannot be fixed with a pill.

Most parents of autistic children can clearly recall that traumatic moment of the diagnosis of "Autism" being announced to them by a doctor followed by the statement "There is nothing that can be done." Well, being a doctor myself, I have to say that your doctor is wrong, there is a lot that can be done! I would even go further, depending on your commitment and certain circumstances, you have a good chance of bringing your child as close as possible to normality! Hundreds of autistic children across the globe, appropriately treated and educated become almost indistinguishable from their typically developing (normal) peers. The sooner the treatment starts - the better are the results, because the younger the child is, the less damage there is to undo and also because they have less catching up to do in their development with normal children of their age. Thankfully, the medical professionals, though often being unhelpful as far as treatment is concerned, are much better nowadays at diagnosing autism. The majority of children get diagnosed by the age of three, which was not the case 10-15 years ago. Receiving the diagnosis so early gives the parents a chance to start acting early, which gives the child a better chance of recovery.

In the western world there is a general tendency to delegate responsibility for our health to the medical profession. If you are ill you go to the doctor. When it comes to autism, after establishing the diagnosis, official medicine has virtually nothing to offer the child. It is a big shock for parents to suddenly find themselves facing this monster called "Autism" on their own. Most of the parents I have met are intelligent and often well-educated people. The first thing they do is to learn as much as possible. Today there is a whole world of information available on the subject of autism, including solid scientific research. Looking at the amount of research done in other areas of medicine in the last 10 years, it is often less than what has been achieved in the field of autism. I believe the reason is that research in autism is almost entirely driven by the most motivated people on Earth - the parents of autistic children. Among them are doctors, biochemists, biologists and simply intelligent people looking for solutions to their child's problem. There is a network of parent organisations across the world keen to share information and help each other. I know a lot of parents who would spend hours on the phone to comfort and help another

parent in the same situation. Treating autism is not an easy task. It takes years of continuous effort and commitment. But, being a parent myself, I can tell you that it is one of the most rewarding experiences on Earth! In this book I would like to share with you what I strongly believe to be the appropriate treatment for an autistic child.

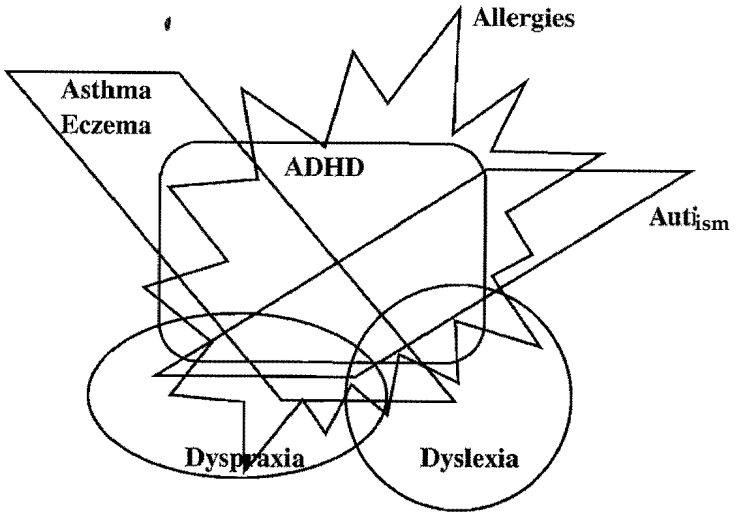
Information on nutrition is not included into the curriculum of western medical schools and consequently doctors have very little idea about the value of nutrition in the treatment of disease. Yet appropriate nutrition is a corner-stone of any successful treatment for any chronic disease Autism and other learning disabilities are no exception. There are many popular misconceptions in this area, which have to be clarified.

Autism used to be a diagnosis considered hopeless. With all the knowledge we have today it is very far from that. And we are still learning every day. Children diagnosed today are much more fortunate than children diagnosed ten years ago (if the word fortunate can be used at all), because their parents have so much more information available to them to start helping their child immediately. Ten years ago we did not know half of what we know today. Parents of newly diagnosed children now have no time to despair - there is too much learning to do! I think, that is very positive. The learning rollercoaster, your child will take you through, will change your life forever. Who knows, it may open new horizons and opportunities for you, as it has done for so many people.

So, let's keep learning!

INTRODUCTION

This book has evolved over a period of three years when I worked with hundreds of children in my clinic. Initially the book was planned to be about autism as the majority of children who came to see me were indeed autistic. However, the more children I saw the more it became clear that we have other epidemics emerging. Attention deficit disorder with hyperactivity and without it (ADHD/ADD), dyspraxia, dyslexia, various behavioural and learning problems, allergies, asthma, eczema - all have reached epidemic proportions. But more than that these seemingly unrelated conditions overlap with each other. After years of working with the children in my clinic I hardly met one child who presented with just one of the above conditions. Every child has two, three or more of these health problems at once. For example, a child would present with allergies; at the same time the parents would describe a couple of asthmatic episodes and eczema and then would talk about their child's extreme clumsiness (dyspraxia) and learning problems. A large percent of allergic and asthmatic children are dyspraxic and hyperactive to various degrees. Many of them have problems with concentration and attention span, which affect their learning ability. There is an approximate 50% overlap between dyslexia and dyspraxia and a 30 50% overlap between ADHD and dyslexia. Children who suffer severe eczema in infancy quite often develop autistic features later in life. Autism and ADHD overlap with every one of the above-mentioned conditions. Apart from being hyperactive many autistic children have severe allergies, asthma, eczema, dyspraxia and dyslexia.



THE OVERLAPPING PICTURE

As we can see, modern medicine has created all these separate diagnostic boxes to fit our children in. But the modern child does not fit into any one of them; the modern child fits into this rather lumpy picture.

Why are all these conditions related? What underlying problem are we missing in our children which makes them susceptible to asthma, eczema, allergies, dyspraxia, dyslexia, behavioural problems, ADHD and autism in different combinations? Why when they become teenagers, do many of these children fall prey to substance abuse? Why do many of these children grow up to become diagnosed with schizophrenia, depression, bipolar disorder and other psychological and psychiatric problems?

To answer all these questions we have to look at one factor, which unites all these patients in a clinical setting. This factor is the state of their digestive system. I have yet to meet a child with autism, ADHD/ADD, asthma, eczema, allergies, dyspraxia or dyslexia, who has not got digestive abnormalities. In many cases they are severe enough for the parents to start talking about them first. In some cases the parents may not mention their child's digestive system, yet when asked direct questions would describe a plethora of gut problems. But what have digestive abnormalities got to do with autism, hyperactivity, inability to learn, mood and behaviour problems? According to recent research and clinical experience - a lot! In fact it appears that the child's digestive system holds the key to the child's mental development. The underlying disorder, which can manifest itself in

different children with different combinations of symptoms, resides in the gut! Rather than trying to fit a child with autistic tendencies, asthma, eczema and hyperactivity or a child with dyspraxia, dyslexia and allergies into any particular diagnostic box we need to have a name for the underlying disorder, which originates in the gut and manifests itself as any combination of the above conditions.

Here I propose a name: **Gut** And Psychology Syndrome or GAP Syndrome. Children with GAP Syndrome often fall into the gap - the gap in our medical knowledge. As a result they do not receive appropriate treatment. In the following chapters we are going to talk in detail about what the GAP Syndrome means, how it develops and how to treat it.

Apart from childhood learning disabilities: autism, ADHD/ADD, dyslexia, dyspraxia and various learning and behavioural problems, there is another group of conditions which fit into the GAP Syndrome. These conditions are schizophrenia, depression, manic depression or bipolar disorder and obsessive compulsive disorder. The father of modern psychiatry French psychiatrist Phillipe Pinel (1745-1828), after working with mental patients for many years, concluded in 1807: "The primary seat of insanity generally is in the region of the stomach and intestines." And yet, the last thing a modern psychiatrist would pay attention to is the patient's digestive system! We will discuss the scientific and clinical evidence pointing in the direction of gut-brain connection in schizophrenic patients.

It is beyond the scope of this book to look at other psychiatric conditions. Hopefully, future clinical experience and research will shed light on how many of them may belong to Gut And Psychology Syndrome. Here we will concentrate on the conditions which receive the diagnostic labels of Autistic Spectrum Disorder, ADHD/ADD, Dyslexia, Dyspraxia and Schizophrenia. This book may also be useful for patients who are diagnosed with allergies, including asthma and eczema.

PART ONE:
WHAT IS GOING ON?

1. ALL DISEASES BEGIN IN THE GUT

Hippocrates, 460-370 BC

GAPS children and adults have digestive problems, sometimes quite severe. Colic, bloating, flatulence, diarrhoea, constipation, feeding difficulties and malnourishment, all to various degrees, are a typical part of autism, schizophrenia and other GAPS conditions. Doctors often explain these symptoms as a result of patient's "funny" feeding habits and are not inclined to investigate them.

Whether we look at a child or an adult with GAPS, in the majority of cases digestive problems start at weaning time or times when breast milk gets replaced with formula milk and other foods get introduced. In many cases parents clearly remember that the diarrhoea or constipation started in the second year, but thinking back would recall that their child had colic, vomiting (reflux) or other digestive symptoms in the first year as well. In cases of GAPS adults it is important to speak to the parents of the patient (if possible) in order to collect a detailed medical history starting from birth. In those cases where an adult did not have a history of gut problems from childhood the digestive problems would start later in life due to some health-damaging event.

The second year of life is the time when many GAPS children start developing fussy eating habits, refusing a whole lot of foodstuffs and limiting their diet to a handful of foods, usually starchy and sweet: breakfast cereals, crisps, chips, popcorn, cakes, biscuits, sweets, bananas, bread, rice, sweet yoghurts. Most of these children would refuse to have vegetables, fruit (apart from bananas), meats, fish and eggs. About 60-70% of the autistic children I have seen in my clinic would have an extremely limited diet, consisting sometimes of two or three items. It is quite rare to meet an autistic child who is not fussy with food. Other GAPS children may not be as

extreme as autistic children but the majority of them also limit their diets in the same typical fashion.

It is also very rare for parents of GAPS children to describe their child's stool as normal. The picture is particularly striking in autistic children. Diarrhoea and constipation would often alternate and, in many cases undigested food is clearly visible in the stool. Very often the stool would have an extremely strong, unpleasant smell and at other times it is so liquid and frothy that the child cannot hold it. Sometimes the stool would be very acid and burn the child's skin in the nappy area. In many cases the stool has a pale whitish colour and floats on the surface of the water, indicating that the child is unable to digest fats. Often the child would have such severe constipation, that he or she would not open the bowel for 5-7 or more days, which then would result in an extremely large and painful stool. This sort of experience makes children fearful of passing stool, so they hold on for as long as they can, making the whole problem even worse. In some cases parents do not notice anything wrong with the stool, but when asked would acknowledge that their child has pronounced flatulence and bloating. In many of these cases the child would wake up at night screaming, when the parents do not know what is wrong. As the excessive gas gets released or simply moves to a different place in the bowel the pain would disappear and the child would settle down.

In the case of autism all these symptoms undoubtedly cause children a lot of discomfort and pain. But unfortunately, due to their inability to communicate most autistic children cannot tell their parents about it, so they express their feelings in other ways: self-stimulation, self-destruction, tantrums, refusing to eat, etc. Children with other GAPS conditions who do not have communication problems often complain of tummy aches and feeling nauseous.

In most cases these children are not tested or investigated by gastro-enterologists. In a few publishe
investigated, an X-ray of their digestive tract almost invariably showed a condition called "faecal compaction with an over-spill syndrome" What does it mean? It means that large amounts of old, compacted faeces are literally glued to the walls of the digestive tract, where they can stay for many months, providing a fertile rotting environment for all sorts of parasites, bacteria, fungi and viruses to breed and thrive, constantly producing a lot of toxic substances which are absorbed into the bloodstream of the child. In this condition new food, eaten by the child, seeps through a narrow channel between these compacted faecal masses. So, whatever stool

comes out of these children is an over-spill, which does not empty the bowel, hence the name - an over-spill syndrome.

Until the last few years, apart from a few anecdotal reports in medical literature on an over- spill syndrome in autistic children, there was virtually no research done in this area. Then in 1998 Dr Andrew Wakefield, a consultant gastro-enterologist at the Royal Free Hospital in London, and his team published their research, suggesting a connection between chronic inflammatory bowel disease and autism. They performed endoscopy and biopsy on a group of autistic children, who were referred to them with gastrointestinal symptoms. Endoscopy is a procedure where a special pipe is inserted into the digestive tract of a patient, through which an investigator can see what is going on there. While an endoscopy is being performed, a small bit of the gut wall can be obtained using a special biting instrument to be later examined under the microscope. This is called taking a biopsy.

As a result of their research, Dr Wakefield and his team have identified a condition in the bowel of these children, which they named *Ileal - Lymphoid - Nodular Hyperplasia and Non - Specific Colitis*. Let us see what it all means.

First we will look at the *Ileal - Lymphoid - Nodular Hyperplasia*. Ileum is a name given to the last three-fifths of the small intestine. Ileum is approximately 3.5 m long in adults and at its end connects to the bowel. The major function of the small intestine in general is food absorption. However, not much food absorption happens in the ileum. The walls of this part of the small intestine are packed with large numbers of lymph nodes, called Peyer's patches, which are small round or bean shaped structures, ranging in size from 1 to 25 mm. These lymph nodes are a very important part of our immune system. We know of two major functions that they fulfil.

1. The first function is filtering the lymph (tissue liquid), coming from the ileum and removing bacteria, viruses, fungi, dead cells (including cancer cells) and various toxins from it. It is a good place to look at what particular infectious agents might be lurking in your intestine because the lymph nodes are like a prison for these viruses, bacteria, dead cells and fungi - if they cannot destroy them, they imprison them. So, when gastro-enterologists perform endoscopies, they always try to get a sample of these lymph nodes to be examined under the microscope. This is what Dr Wakefield's team has done.
2. A second function of lymph nodes is production of lymphocytes - a large group of immune system cells, a major function of which is

fighting infections. In fact lymph nodes themselves are made primarily of lymphocytes, together with some other cells. So, when the lymph nodes are faced with an infection, they start producing a lot of lymphocytes to fight the infection, which makes the lymph nodes large and inflamed, sometimes painful. This enlargement of the lymph nodes is called lymphoid nodular hyperplasia and this is what Dr. Wakefield has found in the ileum of autistic children.

Because many of the children from his study have developed autistic features after MMR vaccine, this is the direction Dr Wakefield pursued when looking at what particular infection may have caused this enlargement of the lymph nodes. Suspecting that it might be the measles virus, he involved in his research a well-known virologist Dr John O'Leary, a professor of pathology from Dublin. Sure enough, Dr O'Leary has found the same measles virus used in the MMR vaccine in the ileal lymph nodes of the autistic children. This particular part of Dr Wakefield's research, concerning the measles virus and MMR vaccine, caused a lot of controversy and vigorous resistance from government and the medical establishment which distracted attention from the main issue. The main issue is: autistic children have enlarged and inflamed lymph nodes in their gut wall, which is a clear sign of a fight with some infection going on there.

Let us now look at the second part of the condition which Dr Wakefield described in his group of autistic children, the *Non - Specific Colitis*. The term Colitis means an inflammation of the colon. Doing the endoscopies, Dr Wakefield's team has found various stages of chronic inflammation in the gut of these children, erosions of the mucous membranes of the colon and intestines, abscesses filled with pus, ulcers and plenty of faecal compaction. In some places the gut wall was so inflamed with such enlargement of the lymph nodes, that it almost obstructed the lumen of the gut. In some ways this inflammation resembled ulcerative colitis, in some - Crohn's disease, when some features were completely unique to these autistic children. That is why this colitis was named non-specific, because it could not be assigned to any existing diagnosis. Dr Wakefield's team called it AUTISTIC ENTEROCOLITIS. This term is yet to be accepted into the official medical vocabulary, but for us who work with autistic children it is a very good term to use.

The findings of Dr Andrew Wakefield and his team, who have examined hundreds of autistic children, have been independently supported by a number of other researchers in the world (Buie *at al.*, Uhlmann *et al.*,

Furlano *et al*, Morris *et al.)*. Apart from published research, there are number of practising doctors around the world, whose clinical observations support the fact that autistic children have a digestive disorder, the severity of which may differ in different children. Based on my clinical experience I would strongly add my voice to theirs: in fact I have yet to meet an autistic child without digestive problems.

So far we have been talking mostly about autism. What about the rest of GAPS patients? There has been a substantial amount of research linking schizophrenia with digestive abnormalities similar to coeliac disease. C. Dohan, R. Cade, K. Rachelt, A. Hoffer, C. Pfeiffer and other doctors and scientists have established a hypothesis of gut-brain connection in schizophrenia and backed it by very serious scientific findings, which we will discuss in detail in the following chapters. Clinical experience shows that the majority of schizophrenic patients suffer from digestive problems. In most cases these problems start in early childhood.

Apart from autism and schizophrenia there is much less published scientific data on gut problems in ADHD, dyslexia, dyspraxia, asthma, allergy, eczema and other GAPS conditions. However, when it comes to clinical observations almost all children and adults with GAPS have digestive problems to various degrees. Many patients have typical symptoms of IBS (Irritable Bowel Syndrome): abdominal pain, bloating, stool abnormalities and flatulence. A small percentage of patients may have normal stools, but would suffer from malnutrition, reflux, "heartburn", abdominal pains and flatulence. In the case of GAPS children most of them limit their diets in the typical GAPS fashion preferring processed carbohydrates to the exclusion of everything else. Many GAPS adults also have similar fussy attitudes to food. I had a number of patients who did not complain of any particular digestive problems. However, when put on GAPS treatment programme have improved dramatically.

The question is: why do GAPS children and adults have their digestive systems in such a condition? What has it got to do with their mental state? To understand that we need to look at some very important fundamental aspects of human gut.

2. THE ROOTS OF A TREE

A human body is like a planet inhabited by huge numbers of various micro-creatures. The diversity and richness of this life on every one of us is probably as amazing as the life on Earth itself! Our digestive system, skin, eyes, respiratory and excretory organs are happily co-existing with trillions of invisible lodgers, making one ecosystem of macro- and micro-life, living together in harmony. It is a symbiotic relationship, where neither party can live without the other. Let me repeat this: we, humans, cannot live without these tiny micro-organisms, which we carry on and in our bodies everywhere.

The largest colonies of microbes live in our digestive system. A healthy adult on average carries 1.5 - 2 kg of bacteria in the gut. All these bacteria are not just a chaotic microbial mass, but a highly organised micro-world with certain species predominating and controlling others. The number of functions they fulfil in our bodies are so vital to us, that if our gut got sterilised, we would probably not survive. In a healthy body this microbial world is fairly stable and adaptable to changes in their environment. Let's look at who is who in there?

Gut micro-flora can be divided into three groups:

1. **Essential or beneficial flora** This is the most important group and the most numerous in a healthy individual. These bacteria are often referred to as our indigenous friendly bacteria. The main members of this group are: *Bifidobacteria*, *Lactobacteria*, *Propionobacteria*, physiological strains of E.coli, *Peptostreptococci* and *Enterococci* We are going to look in detail at what good work they do in our bodies.
2. **Opportunistic flora** This is a large group of various microbes, the number and combinations of which can be quite individual. These are: *Bacteroids*, *Peptococci*, *Staphylococci*, *Streptococci*, *Bacilli*, *Clostridia*, Yeasts, *Enterobacteria (Proteus*, *Clebsielli*, *Citrobacteria*, etc.), *Fuzobacteria*, *Eubacteria*, *Catenobacteria* and many others. There are around 500 various species of microbes known to science

so far, which can be found in the human gut In a healthy person their numbers are normally limited and are tightly controlled by the beneficial flora. Each of these microbes is capable of causing various health problems if they get out of control.

3. **Transitional flora** These are various microbes, which we daily swallow with food and drink, usually non-fermenting Gram-negative bacilli from the environment. When the gut is well protected by beneficial bacteria, this group of microbes goes through our digestive tract without doing any harm. But if the population of the beneficial flora is damaged and not functioning well this group of microbes can cause disease.

So, what are all these microbes doing there and why do we need them?

Health and integrity **of the** gut

A human digestive tract is a long tube open to the outside world at its start and at its end. Whatever harmful things there are in the outside world, our digestive system is a perfect entrance for them into our bodies. We eat and drink plenty of micro-organisms, chemicals and toxins every day. How do we survive?

One of the major reasons is the fact that the whole length of the digestive tract is coated with a bacterial layer, much like a thick layer of turf on the surface of the gut epithelium, providing a natural barrier against invaders, undigested food, toxins and parasites. And, just like a soil unprotected by turf becomes eroded, the gut wall suffers if its protective bacterial "turf" gets damaged. How do our indigenous bacteria protect the gut wall?

Apart from providing a physical barrier, they work against invasive pathogenic microorganisms by producing antibiotic-like substances, anti-fungal volatiles, anti-viral substances including interferon, lizocym and surfactins that dissolve membranes of viruses and bacteria, they engage the immune system to respond appropriately to invaders. In addition, by producing organic acids, the beneficial bacteria reduce pH near the wall of the gut to 4.0-5.0, making a very uncomfortable acidic environment for growth and activity of pathogenic "bad" microbes, which require more alkaline surroundings.

Pathogenic microbes produce a lot of very potent toxins, not to mention all the toxic substances that we ingest with food and drink. Our healthy indigenous gut flora has a good ability to neutralise nitrates, indoles,

phenols, skatol, ksenobiotics and a lot of other toxic substances, inactivate histamine, chelate heavy metals and other poisons. The cell walls of beneficial bacteria absorb many carcinogenic substances, making them inactive. They also suppress hyperplastic processes in the gut, which is the basis of all cancer formation.

So, if the beneficial bacteria in the gut are damaged and are not functioning as they should, then the "w
well, which is a typical situation in a GAPS gut. Without protection the gut
wall is open to invasion by anything that comes along: a virus from vaccination or the environment, a ubiq
various bacteria and parasites and toxic substances, all of which are very
capable of damaging our digestive system and causing a chronic inflammation in its walls. And we must
which normally lives in the gut, tightly controlled by the beneficial bacteria. They are always there and ready to cause trouble, if their guardians, the good bacteria, are weakened. Studies with microscopic examination of a biopsy of the gut wall show that in healthy individuals there is a thick bacterial band attached to gut mucosa, keeping it intact and healthy. In inflammatory bowel disease different pathogenic bacteria are found in the mucosa, even inside the gut cells, which means that the protective bacterial band has been broken and allowed the pathogens to reach the sacred gut wall.

To make the situation even worse, without well functioning gut flora the gut wall not only becomes unprotected, but also malnourished. Normal gut flora provides a major source of energy and nourishment for the cells, which are lining the digestive tract. The beneficial bacteria living on the gut epithelium digest the food, which comes along, converting it into nourishing substances for the gut lining. In fact it is estimated that gut epithelium derives 60-70% of its energy from bacterial activity When the gut flora is compromised, the lack of nourishment it would produce adds to the damage of the digestive wall. This sets up a chain of degenerative changes in the digestive wall structure, which would further impair its ability to digest and absorb nutrients.

To understand what exactly happens in the gut of your child, let us have a look at some anatomy and physiology of the gut lining. The absorptive surface of intestines has a wonderful structure of finger-like protrusions,
called villi and deep crypts between them. The epithelial cells called enterocytes, which coat the villi are
process and absorb the nutrients from food. These cells work very hard, so

they have to be always young and in a good shape to do their job efficiently. As usual, Mother Nature organised it in the most marvellous way. These enterocytes are constantly born in the depth of the crypts. Then they slowly travel to the top of the villi, doing their job of digestion and absorption and getting more and more mature on the way. As they reach the top of the villi, they get shed off. This way the epithelium of intestines gets constantly renewed to ensure its good ability to do its work well (FIG. 1).

Animal experiments with sterilisation of the gut found that when the beneficial bacteria living on the intestinal epithelium are removed this process of cell renewal gets co from crypts to the top of the villi becomes a few times longer, which upsets the maturation process of enterocytes and often turns them cancerous. The mitotic activity in the crypts get significantly suppressed, which means that much less cells will be born there and much less of them will be born healthy and able to do their job properly. The state of the cells themselves becomes abnormal. All because their housekeepers, the healthy gut bacteria, are not there to take care of them (FIG. 2).

That is what happens in a laboratory animal with a sterilised gut. In a human body the absence of good bacteria always coincides with bad bacteria getting out of control, which makes the whole situation much worse. Without the care of beneficial bacteria while under attack from pathogenic flora, the whole structure of gut epithelium changes, starting a process of pathology or disease developing. The villi degenerate and become unable to digest and absorb food properly, leading to malabsorption, nutritional deficiencies and food intolerances.

Gut flora is the housekeeper of the digestive system. The state of the house and its ability to fulfil its purposes directly depends on how good the housekeeper is. Anatomical integrity of our digestive tract, its functionality ability to adapt and regenerate, ability to defend itself and many other functions are directly dependent on the state of its microscopic housekeepers - our gut flora. As we will see later, GAPS children and adults have a very abnormal gut flora, which results in digestive abnormalities.

Nourishment **of** the **body**

Everybody knows that the main purpose of having a digestive system is to be able to digest and absorb food. Scientific and clinical experience shows that without healthy gut flora the digestive system cannot fulfil these functions efficiently. A good example is the digestion of milk and wheat

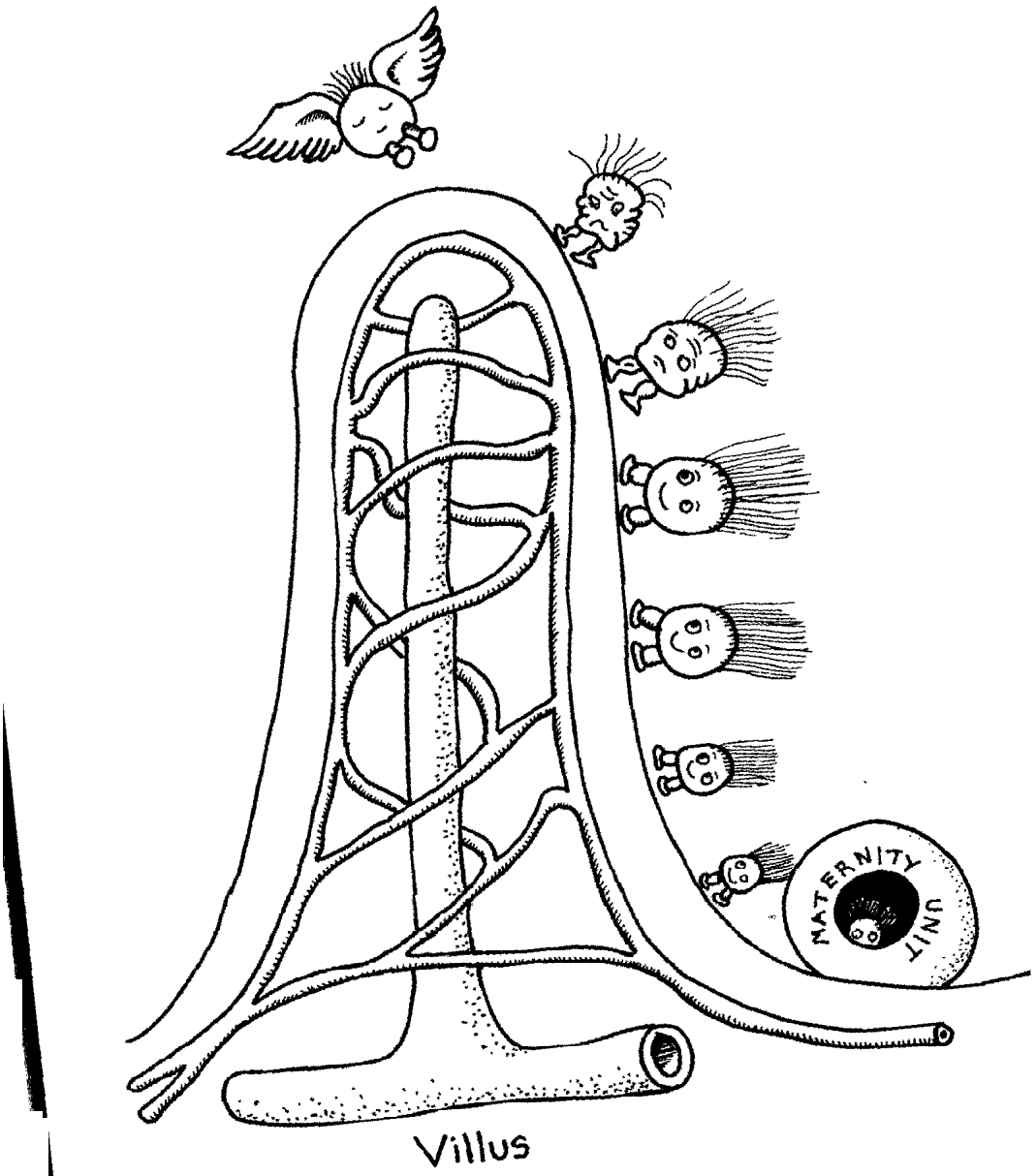


FIG. 1 The life-cycle of an enterocyte.

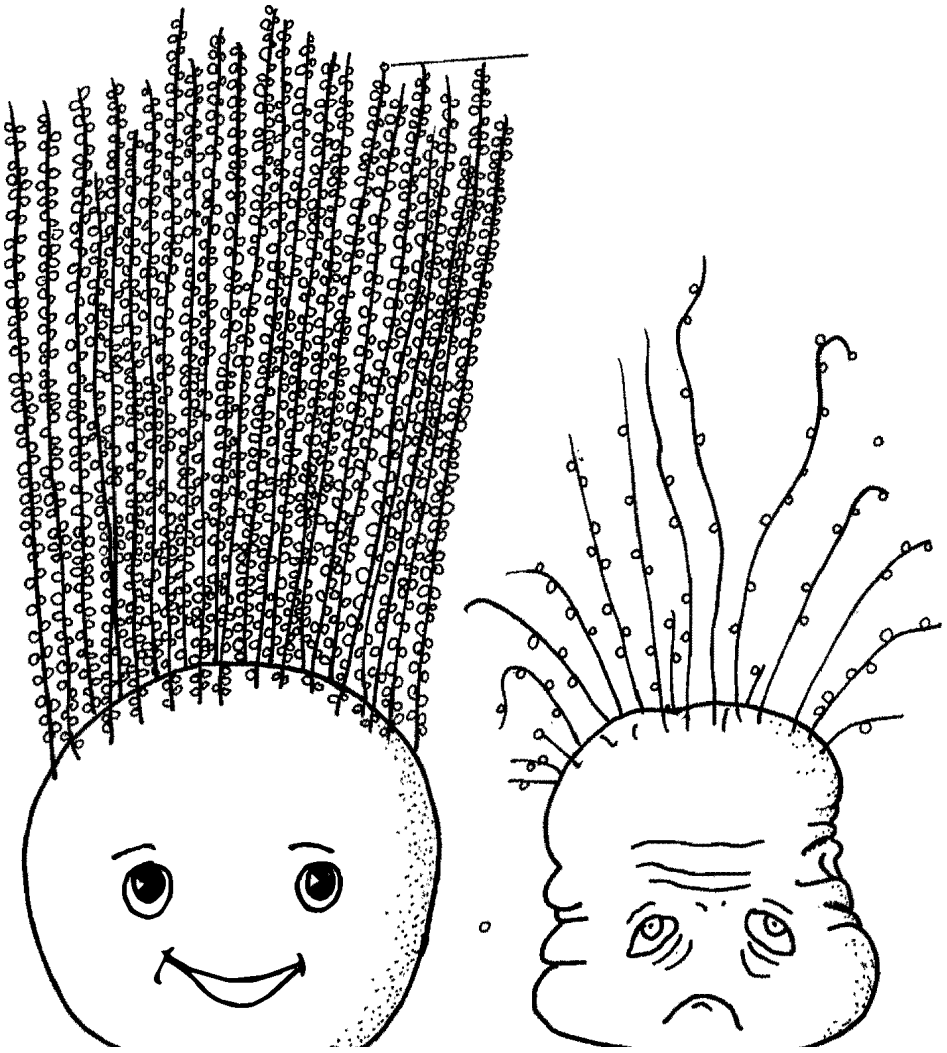


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FIG. 2 The hair on the enterocytes represent microvilli. As the enterocytes cover the surface of the villi their hair (microvilli) make a so-called brush-border, where the last steps in digestion of food happen.

proteins which happens in two stages. The first stage occurs in the stomach where, under the influence of digestive juices produced by the stomach walls, milk and wheat proteins get split into peptides, some of which have morphine-like structure called casomorphines and gluteo-morphines (or gliadinomorphin all of us. Then these peptides move to the small intestine where the next stage of their digestion happens. They get subjected to pancreatic juices and then reach the intestinal wall where they are broken down by enzymes, called peptidases, on the microvilli of enterocytes. This is the stage which is missing in people with abnormal gut flora because of the poor state of their enterocytes. As a result casomorphines and gluteomorphines get absorbed into the bloodstream unchanged and cause problems in the body, in particular interference with brain f There has been a considerable amount of research in this area in patients with autism, schizophrenia, ADHD, psychosis, depression and autoimmunity, who show high levels of casomorphines and gluteomorphines in their bodies, which means that their gut wall is in no fit state to complete appropriate digestion of these substances. Clinical experience shows that when the gut flora is restored, many GAPS patients can digest casein and gluten in moderate amounts without their symptoms returning.

Apart from keeping the gut wall in good shape, the healthy gut flora populating this wall has been designed to take an active part in the very process of digestion and absorption. So much so, that the normal digestion and absorption of food is probably impossible without well-balanced gut flora, It has an ability to digest proteins, ferment carbohydrates, break down lipids and fibre. By-products of bacterial activity in the gut are very important in transporting minerals, vitamins, water, gases and many other nutrients through the gut wall into the bloodstream. If the gut flora is damaged, the best foods and supp chance of being broken down and absorbed.

Certain ingredients in our foods cannot be digested by a human gut at all without the help of beneficial bacteria. A good example is dietary fibre. In a gut with healthy gut flora the fibre gets partially broken down to oligosaccharides, amino-acids, minerals, organic acids and other useful nutrients to feed the gut wall and the rest of the body. Most of us are aware that dietary fibre is good for us. Fresh fruit and vegetables, whole grains, nuts and seeds, beans and pulses are all good sources of fibre. Supplemental fibre in the form of sachets, capsules or drinks is often prescribed to people by doctors to lower their blood cholesterol levels, to remedy constipation

and many other digestive problems, to help bile metabolism, to prevent bowel cancer, to improve glucose tolerance in diabetics, etc., etc. There is a long list of benefits from regular consumption of dietary fibre. Well, fibre is one of the natural habitats for beneficial bacteria in the gut. They feed on it, producing a whole host of good nutrition for the gut wall and the whole body, they engage it in absorbing toxins, they activate it to take part in water and electrolytes metabolism, to recycle bile acids and cholesterol, etc., etc. It is the bacterial action on dietary fibre that allows it to fulfil all those good functions in the body. And when these good bacteria are damaged and are not able to "work" the fibre, dietary fibre itself can become dangerous for the digestive system, providing a good habitat for the bad pathogenic bacteria and aggravating the inflammation in the gut wall. This is when gastroenterologists have to recommend their patients have a low-fibre diet. Consequently, dietary fibre alone without the beneficial bacteria present in the gut can end up not being all that good for us. And indeed GAPS children and adults who are prone to diarrhoea or loose stools have to have low fibre in their diet until the diarrhoea clears.

Apart from fibre there is another substance which most of us would not be able to digest without our good bacteria in the gut. This substance is milk sugar, called Lactose. It is a well-known fact that a lot of people are Lactose intolerant, which means that they can't digest milk. Most GAPS children and adults are among these people. The explanation offered by science so far is that many of us lack an enzyme called Lactase to digest Lactose. If we are not meant to digest Lactose, then why do some people seem to manage it perfectly well? The answer is that these people have the right bacteria in their gut. One of the major Lactose digesting bacteria in the human gut is *E.coli.* It comes as a surprise to many people that physiological strains of *E.coli* are essential inhabitants of a healthy digestive tract. They appear in the gut of a healthy baby from the first days after birth in huge numbers: 10^7 - 10^9 CFU/g and stay in these same numbers throughout life, providing that they do not get destroyed by antibiotics and other environmental influences. Apart from digesting Lactose, physiological strains of *E.coli* produce vitamin K and vitamins Bi, B2, B6, Bi2, produce antibiotic-like substances, called colicins, and control other members of their own family which can cause disease. In fact having your gut populated by the physiological strains of *E.coli* is the best way to protect yourself from pathogenic species of *E.coli.* They also take a huge and complex part in appropriate functioning of the immune system, which we will talk about later.

Apart from *E.coli*, other beneficial bacteria in the healthy gut flora will not only ensure appropriate absorption of nutrients from food but also actively synthesise various nutrients: vitamin K, pantothenic acid, folic acid, thiamin (vitamin Bi), riboflavin (vitamin B2), niacin (vitamin B3), pyridoxine (vitamin B6), cyanocobalamin (vitamin Bi2), various amino acids and other active substances. In the process of evolution Nature made sure that when the food supply is sparse, we humans don't die from vitamin and amino acids deficiencies. Nature provided us with our own factory for making these substances - our healthy gut flora. And when this gut flora is damaged despite adequate nutrition we develop vitamin deficiencies. Why? Because most water-soluble vitamins have a fairly short life in the body. So, unless one is taking these vitamins every hour (providing that they can get absorbed at all withouthealthy gut flora), there will be periods during the day when the body would be deficient in these vitamins. That is what happens to people with damaged gut flora which is unable to provide a constant steady stream of water-soluble vitamins for the body to use. Every tested GAPS child or adult shows deficiencies in those very vitamins, which their gut flora is supposed to produce. Restoring the beneficial bacteria in their gut is the best way to deal with those deficiencies.

Most people with abnormal gut flora have various stages of anaemia. It is not surprising. They not only can't absorb essential for blood vitamins and minerals from food, but their own production of these vitamins is damaged. On top of that people with damaged gut flora often have a particular group of pathogenic bacteria growing in their gut, which arejron-loving bacteria *{Actinomyces spp., Mycobacterium spp.,* pathogenic strains of *E.coli, Cotynebacterium spp.* and many others). They consume whatever iron the person gets from the diet, leaving that person deficient in iron. Unfortunately, supplementing iron makes these bacteria grow stronger and does not remedy anaemia.

The majority of GAPS patients I have seen look pale and pasty and their blood tests often show changes typical for anaemia. Many of these patients have been prescribed iron tablets by their doctors. However, it takes much more to remedy anaemia than supplementing iron. To have healthy blood the body needs magnesium, copper, manganese, iodine, zinc and many other minerals, a whole host of vitamins: Bi, B2, B3, B6, Bi2, C, A, D, folic acid, pantothenic acid and many amino acids. It has been shown in a large number of studies all over the world, that just supplementing iron does not do much for anaemia. It saddens me to see that doctors still prescribe it to anaemic patients giving them a lot of unpleasant digestive side-effects due

to encouraging growth of pathogenic iron-loving bacteria and direct negative effect on the cells of the gut lining, which are already inflamed and very sensitive in GAPS patients.

People with abnormal gut flora have multiple nutritional deficiencies due to all the factors described above. Every GAPS child and adult who has been tested shows a typical picture of nutritional deficiencies in many important minerals, vitamins, essential fats, many amino acids and other nutrients. The most common deficiencies are in magnesium, zinc, selenium, copper, calcium, manganese, sulphur, phosphorus, iron, potassium, sodium, vitamins Bi, B2, B3, B6, B12, C, A, D, folic acid, pantothenic acid, omega-3, omega-6 and omega™9 fatty acids, taurine, alpha-ketoglutaric acid, glutathione and other nutrients. This usual list of nutritional deficiencies, commonly seen in GAPS patients, includes some of the most important known nutrients for normal functioning and development of the brain, immune system and the rest of the body Despite the fact that some of GAPS children appear to grow very well, often being large for their age, they are malnourished in very important micronutrients. And knowing the state of their digestive system, it is not surprising. A well-functioning gut with healthy gut flora holds the roots of our health. And, like a tree with sick roots is not going to thrive, the rest of the body cannot thrive without a well-functioning digestive system. The bacterial population of the gut - the gut flora™ is the soil around these roots, giving them their habitat, protection, support and nourishment.

As we know, the roots of a tree, invisible, hidden deep under the ground, play a crucial role in the well-being of every branch, every twig, every little leaf of that tree, no matter how proudly high and far they may be from those roots. In the same way the diverse and multiple functions of gut flora reach in the body far beyond the gut itself. Let us look at one of the most important^branches" in the body-the immune system.

3. IMMUNE SYSTEM

People with GAP Syndrome have got a compromised immune system. When we test their immune status, deficiencies in various immunoglobulins are found, while other immunoglobulins may be increased out of proportion. Deficiencies in complement, various cells, enzymes and other parts of the immune system are common. It appears that the whole of the immune system in GAPS children and adults is out of balance. But the most scary thing that happens is that their immune system starts to produce antibodies attacking the body's own tissues, including brain and the rest of the nervous system. It is an immune system deeply upset and out of control, scavenging on its own body.

Why does this happen? Has it got anything to do with the state of these patients' digestive system? There is no doubt that it has!

The epithelial surface of the digestive system inhabited by huge numbers of bacteria can truly be described as the cradle of the immune system, both systemic and mucosal. A baby is born with an immature immune system. Population of the baby's digestive tract with healthy bacterial flora plays a crucial role in the appropriate maturation of its immune system. If establishment of balanced gut flora does not take place around the first 20 days of life, then the baby is left immune-compromised. The beneficial bacteria which take up residence on the epithelium of the gut wall play a major immunomodulatingrole in a number of ways. Let us look at some of them in detail.

Essential or beneficial bacteria in our digestive system engage a very important member of the immune system-the lymphoid tissue of the gut wall and take part in the production of huge numbers of lymphocytes and immunoglobulins. For example, in the cell wall of *Bifidobacteria* (the good bacteria largely populating the human colon) there is a substance called Muramil Dipeptide which activates synthesis of one of the most important groups of immune system cells-lymphocytes. As a result a healthy gut wall is literally infiltrated, jam-packed with lymphocytes, ready to protect the body from any invader. Scientific research shows that in people with dam-

aged gut flora there are far fewer lymphocytes in the gut wall, which leaves it poorly protected. There are commercial companies trying to make supplements from Muramil Dipeptide to help the immune system. I believe that it is better to restore a healthy colony of *Bifidobacteria* in the gut, which will produce Muramil Dipeptide naturally, as well as many other useful substances which these bacteria normally supply.

Lymphocytes in the gut wall produce immunoglobulins. The most important one in the gut is Secretory Immunoglobulin A (IgA). Secretory IgA is a substance which is produced by lymphocytes in all mucous membranes in the body and excreted in body fluids. It is found in breathing passages, nose, throat, bladder, urethra, vagina, saliva, tears, sweat, colostrum, breast milk and of course the mucous membranes of the digestive system and its secretions. Its job is to protect mucous membranes by destroying and inactivating invading bacteria, viruses, fungi and parasites. It is one of the immune system's ways of dealing with the unwelcome invaders coming with food and drink into our digestive system. Microbiological science established a fact that when the healthy gut flora is compromised in humans and in laboratory animals the number of cells producing IgA falls dramatically and their ability to produce this important immunoglobulin is severely reduced. This, of course, would greatly lessen the ability of the gut to protect itself. In addition quite soon after being excreted the Immunoglobulin A naturally degrades. Apart from stimulating its production, the beneficial bacteria slow down its degradation through a very complex process, allowing the IgA more time to do its work. IgA is commonly deficient in GAPS children and adults due to their abnormal gut flora. As a result their gut wall has poor ability to defend itself from fungi, viruses from vaccinations or the environment, bacteria and parasites.

Lymphocytes are not the only immune cells, which should be present in abundance in the digestive wall. When there is a deficiency of beneficial bacteria in the gut, other groups of immune cells, called neutrophils and macrophages cannot do their job properly either. These are the cells, which gather in infected and inflamed tissues and clean them up by literally swallowing viruses, toxins, bacterial and cellular debris and destroying them. Approximately 126 billion neutrophils per day leave the blood and pass through the wall of the gastrointestinal tract. In people with abnormal gut flora these cells reduce their ability to tackle antigens, in other words they can't destroy invaders and their toxins efficiently, even when their phagocytic (swallowing) ability may appear to be normal. We don't know yet how it happens. What we do know is that this will allow viruses, bacteria and

other invaders to survive and persist inside of neutrophils and macrophages - the very cells, which are supposed to destroy them.

Apart from ensuring appropriate function of lymphocytes, IgA and phagocytes, healthy gut flora takes a very important part in the production of interferons, cytokines and many other active regulators of immune response, particularly in fighting viral infections. Millions of children and adults around the world are exposed to viruses from vaccines or the environment. If these people have got well-functioning gut flora, then these viruses do them no harm, because their bodies are well equipped to deal with them. In GAPS people due to the abnormalities in their gut flora viruses from vaccines or the environment have a good chance to survive and persist. A good example is the measles virus found in the gut wall and spinal fluid of autistic children. It is quite reasonable to suspect that this virus comes from the MMR (measles-mumps-rubella) vaccination.

Another fascinating way in which beneficial bacteria work with the immune system is a so-called "mimicking phenomenon". The bacteria on the surface of gut epithelium and the cells of this epithelium swap antigens rather like children swapping their hats when playing hide and seek to fool the seeker. This swapping of antigens improves efficiency of a large number of various immune responses, particularly in local immunity. Unfortunately, in GAPS patients this swapping can work against them as many pathogenic microbes can play this game as well. There is a debate in scientific literature about the measles virus using this mimicking phenomenon to fool the immune system into attacking its own tissues.

Gut flora's influence on the immune system reaches far beyond the gut itself. The research shows that when the gut flora is damaged, not only the levels of IgA, lymphocytes, macrophages, interferons, cytokines, etc. in the digestive system drop but the whole immune system in the body gets out of balance. This process makes the person immune-compromised.

To understand all this, let's imagine a medieval fort with high stone walls. The soldiers are on the walls defending them with guns, catapults and other weapons^ appropriate for the job of fighting. Inside the fort there are civilians, who grow crops, cook food for the defenders and do all the civilian jobs. They have spades, cooking pots and all other tools for doing their jobs. When an enemy comes, it is the job of the soldiers to fight them. Imagine that the soldiers fail and the enemy starts getting inside the fort. Now the civilians are faced with the job of the soldiers. The civilians do not have appropriate training or tools for fighting so they are going to use whatever they have to hand - their gardening tools, cooking pots, etc.

These tools are not made for fighting so the civilians are not going to be as effective at defending the fort as the soldiers with their weapons.

Something along these lines happens in the body, when the gut flora is compromised. There are two major armies in the immune system: Thi immunity (the soldiers on the walls of the fort) and **Th2** immunity (the civilians inside the fort). The soldiers on the walls, Thi immunity (T-cell helper type **1),** promotes a so-called cell-mediated immunity, which is located everywhere the body is in contact with the outside world. Its role is to fight infections in the mucous membranes, skin and inside cells. It is a first and very effective barrier to any invasion into the body. Secretory immunoglobulin A is assigned to this system as well as Interleukin**-2** (IL**-2),** Interleukin **12** (IL**-12),** gamma interferon and some other substances. As we have seen, healthy gut flora plays an extremely important role in keeping this part of immunity active and up to its job. When the bodily flora is damaged, then this part of immunity becomes less efficient and starts letting unwanted microbes and toxins through into the body. The body responds by activating the second army in the immune system (the civilians inside the fort) the **Th2** immunity (T-cell helper type **2)** responsible for humoral immunity or immunity in the liquids of the body. The main players in this system are Interleukins **4, 5! 6** and **10,** alpha interferon and IgE. Immunoglobulin E (IgE) is the master of allergic reactions in the body, it is very active in people with asthma, eczema, hay fever and other allergies. In a person with abnormal gut flora this **Th2** system becomes overactive, which predisposes the person to atopic or allergic type reactions, chronic inflammation, autoimmunity and many other undesirable effects. Like civilians in a fort, armed with the wrong tools and not trained to fight, the **Th2** system is not going to defend the fort in the right way.

We need both the Thi and **Th2** immunity in the body, but they have to be in the right balance. The imbalance between Thi and **Th2** immunity with underactive Thi and overactive **Th2** is a usual picture in chronic viral infections, allergies, chronic fatigue syndrome, candidiasis, asthma, eczema, autism and most other GAPS conditions. Why? Because all these conditions, though they look quite different, have one big thing in common - a gut dysbiosis or abnormal gut flora, which is the major balancing agent between Thi and **Th2** immunity. To carry on with the medieval fort analogy, it is the gut flora that keeps the soldiers on the walls in large numbers, alert, well trained and always ready to fight. When the gut flora is not functioning well, then the soldiers become relaxed and lazy, some of them go inside the fort to help the civilians with their jobs, so the number of soldiers on the

walls get smaller, making the Thi immunity weak and out of balance with the **Th2** immunity.

On the whole it is hard to overestimate how important the state of our gut flora is in the appropriate functioning of our immune system. The gut wall with its bacterial layer can be described as the right hand of the immune system. If the bacterial layer is damaged or, worse than that, abnormal, then the person's immune system is trying to function with its right hand tied behind its back.

In the previous chapter we covered in detail the various nutritional deficiencies which people with abnormal gut flora develop. An immune system cannot function without constant nourishment, it requires most known vitamins and minerals, amino acids and fats to be able to do its job. GAPS patients have a long list of nutritional deficiencies due to abnormal digestion and absorption, so their immune system is not only unbalanced, but also malnourished.

But as if all that is not enough, an immune system in a body with abnormal bacterial flora is exposed to a whole host of extremely toxic substances, many of which have a direct damaging effect on immunity. These toxins come from all the opportunistic microbes, which happily overgrow in the gut and elsewhere in the body of a person with GAPS thanks to the absence of beneficial flora's control.

We have already examined what happens to the digestive wall when the gut flora is abnormal: it becomes damaged and leaky. A constant stream of invaders and undigested food comes through the damaged epithelial barriers in the gut. The immune system has to deal with all that, while being malnourished, deficient, compromised, unbalanced and intoxicated.

So, should it come as a surprise to us that GAPS children and adults have their immune system in such a poor state?

4. WHAT CAN DAMAGE GUT FLORA?

We have looked in detail at the different roles our indigenous gut flora plays in the body. We have seen how important it is for us to keep this microscopic world inside us healthy and active. However, in our modern world this task has become extremely difficult if not impossible. Let us have a look at what dangers our gut flora has to face on a regular basis.

Antibiotics

We all have taken antibiotics in our lives. It is one of the most commonly prescribed medications in our modern world. Since the moment we are born we are likely to be exposed to this group of drugs on a regular basis not only through prescription, but also through food. Farm animals and poultry are routinely given antibiotics, so all the products we get from them (meat, milk, eggs) will provide us with a constant supply of antibiotics and antibiotic resistant bacteria, which these animals develop in their bodies and all the toxins which these bacteria produce.JFarmed fish like salmon has antibiotics routinely added to their tanks, A lot of fruit and vegetables are sprayed with antibiotics to control disease. The way things are in our sophisticated modern world we simply cannot avoid exposure to antibiotics. It has become such a "normal" part of life'that not many of us ask the question "What are they doing to us?" And as the production of antibiotics grew from hundreds of tons a year in the 1950s to tens of thousands of tons a year in the 1990s, so grew the evidence and worried research into the harmful effects of this group of drugs on human health. Let us see what this research shows:

- Antibiotics have a devastating effect on beneficial bacteria in the human body, not only in the gut but in other organs and tissues.
- Antibiotics change benign bacteria, viruses and fungi into pathogenic, giving them an ability to invade tissues and cause disease.
- Antibiotics change bacteria making it resistant to antibiotics, so the

industry has to work on more and more powerful new antibiotics to attack these new changed bacteria. A good example is tuberculosis, where wide use of antibiotics has created new varieties of the *Mycobacterium Tuberculosis* resistant to all existing antibiotics.

- Antibiotics have a direct damaging effect on the immune system, making us more vulnerable to infections, which leads to a vicious cycle of more antibiotics and more infections.

Let us have a look at what different groups of antibiotics do to the gut flora.

Penicillins

In this group we have very widely used Amoxicillin, Ampicillin, Flucloxacillin and all other antibiotics with "-cillin" at the end of their name. These drugs have a damaging effect on two major groups of our beneficial resident bacteria: *Lactobacilli* and *Bifidobacteria*, while promoting growth of pathogenic *Proteus* family, *Streptococci* and *Staphylococci* This particular group of antibiotics allow bacteria normally found only in the bowel to move up to the intestines, which predisposes the person to development of IBS (Irritable Bowel Syndrome) and other digestive disorders.

Tetracyclines (Tetracycline, Doxycycline and other "-cyclines")
This group of drugs is routinely prescribed to teenagers for acne as a long course, lasting from three months to two years. Tetracyclines have a particular toxic effect on the gut wall by altering protein structure in the mucous membranes. This in turn does two things. First, it makes the gut wall anatomically vulnerable to invasion by pathogenic microbes; second, it alerts the immune system to attack these changed proteins, starting an auto-immune reaction in the body against its own gut. In parallel tetracyclines stimulate growth of disease causing *Candida* fungus, *Staphylococci* and *Clostridia* in the digestive tract.

Aminoglycosides (Gentamycin, Kanamycin), *Macrolides* (Erythromycin) and other "-mycins"
These drugs have a particular devastating effect on colonies of such beneficial bacteria in the gut as physiological *E.coli* and *Enterococci. A* prolonged course of treatment can completely eliminate these bacteria from the digestive system, leaving it open to invasion by pathogenic species of *E.coli and* other microbes.

Antifungal antibiotics (Nystatin, Amphotericin, etc.)
These drugs lead to selective stimulation of growth of the *Proteus* family and lactose-negative *Exoli* species, capable of causing serious disease.

Combinations of antibiotics have stronger damaging effects on the gut flora than single drugs. The damage is worse when antibiotics are administered orally and when the course of antibiotic is a lengthy one on a low dose, like the one prescribed for acne, chronic cystitis, chronic ear infection and other chronic infections. Medical personnel and workers in pharmaceutical industry are at a particular risk of chronic exposure to low doses of antibiotics and indeed gut dysbiosis is very common among these people.

When an antibiotic is prescribed in a high dose, it leaves the gut with a lot of empty niches to be populated by whatever bacteria, viruses or fungi would get there first. This is a crucial time to administer a good probiotic to make sure that these niches get populated by friendly bacteria instead of pathogenic ones. Even when the course of antibiotic is short and the dose is low, it takes different beneficial bacteria in the gut a long time to recover: physiological *Exoli* takes one to two weeks, *Bifidobacteria* and *Veillonelli* take two to three weeks, *Bacteroids*, *Peptostreptococci* take a month. If in this period the gut flora is subjected to another damaging factor(s), then gut dysbiosis may well start in earnest.

The majority of GAPS patients I have seen have been exposed to numerous courses of antibiotics during their life. The most common reasons in children are repeated ear infections, chest infections, impetigoand mastitis in the breast-feeding mother, when the baby would get antibiotics through the breast milk. Considering that many of these children had little chance to develop a healthy gut flora from the beginning, these courses of antibiotics would have a devastating effect on their fragile gut ecology.

Other drugs

Most drugs, particularly prescribed for long periods of time or permanently, have a detrimental effect on gut flora.

Pain killers or analgesics (aspirin, ibuprofen, etc.) are often prescribed for long periods of time to people with chronic pain. These drugs stimulate growth of haemolytic forms of bacteria and *Campylobacter*in the gut, all of which are capable of causing disease.

Steroid drugs, like Prednisolone, Hydrocortisone, Betamethasone, Dexamethasone, etc. damage gut flora. In addition, they have a strong

immunosuppressing ability, which makes the body vulnerable to all sorts of infection. For example, it is known that a course of steroids is almost invariably associated with fungal overgrowth in the body, particularly of *Candida* species.

Contraceptive pills or The Pill is something many women take for many years, often from a very young age. This group of drugs has a devastating effect on the gut flora. By the time a woman is ready to have children, she has been on these drugs for a long period of time and has an abnormal gut flora. A human baby is born with a sterile gut and acquires most of its gut flora from the mother. So if the mother has an abnormal gut flora, that is what she will pass to her child, predisposing this child to eczema, asthma, other allergies and in severe cases to learning disabilities.

Many other groups of drugs, including sleeping pills, "heartburn" pills, neuroleptics, cholinolytic drugs, cytotoxic drugs, etc., etc. cause different damage to the gut flora, digestive system and immune system.

Drug-induced gut dysbiosis is usually the most severe and the most resistant to treatment. In the last 50 years we have seen a tremendous increase in drug use by western population. It almost became a normal part of life to take some sort of prescription or over-the-counter drug, something to talk about with your neighbours. Yet not many people think what these drugs are doing to their bodies, let alone to their gut flora.

What other factors can have an effect on gut flora?

Diet

What we eat has a direct effect on the composition of the gut flora, A modern diet of convenience rather than nutrition, full of processed foods, has a serious detrimental effect on the gut flora.

Too much sugary foods and processed carbohydrates increase numbers of different fungi, *Candida* species in particular, *Streptococci*, *Staphylococci*, some *Clostridia* species, *Bacteroids* and some aerobic opportunistic bacteria. Processed and sugary carbohydrates (white bread, cakes, biscuits, pastries and pasta) also promote population of the gut with worms and other parasites.

A diet low on fibre from fresh fruit and vegetables has a profound negative effect on gut flora and general body metabolism, predisposing the person to bowel cancer, atherosclerosis, abnormalities in hormonal metabolism and many other problems.

Bottle-fed babies develop completely different gut flora to the breast-fed babies.

Breast-feeding is essential for appropriate population of baby's gut with balanced healthy gut flora. Babies are born with a sterile gut. Breast-feeding is the one and only opportunity we have in our lives to populate the entire surface of our gut with a healthy mixture of bacteria to lay the veiy basis of our future health. Bottled~fed babies have their gut populated by a combination of different bacteria, which predisposes them later to many health problems. We have a whole generation of people, mainly born in the **1960s** and **1970s** who were not breast fed because it was not fashionable. A whole host of medical problems that arose from that fashion have made it obvious to the medical profession and the rest of us how important breast-feeding is. Thankfully, now, a majority of mothers do their best to breast feed their newborn babies.

Prolonged fasting and starvation, overeating and parenteral feeding can seriously alter the composition of gut flora and start a chain of health problems, so supplementing beneficial bacteria in a form of probiotic would be a good idea in these situations.

Generally, when gut dysbiosis is caused exclusively by poor diet it is usually fairly mild and can be corrected by better eating habits. Unfortunately, in our modern world it is rare not to be exposed to other factors which would also damage your gut flora, antibiotics for example.

Disease

Different infectious diseases, like typhoid, cholera, dysentery, salmonella and some viral infections can cause lasting damage to the gut flora. Repopulating the gut with beneficial bacteria has to he an important part of the treatment of patients with these serious infections.

Different chronic illnesses are accompanied by serious defects in gut flora, like diabetes, autoimmune disease, endocrine disease, obesity and neurological conditions. It is a common after-effect of surgery, chemotherapy, hormone therapy and radiotherapy.

Stress

A short-term stress has a detrimental effect on the gutflora,but it usually recovers well after the stressful situation is over. However, a long-term physical or psychological stress can do permanent damage to the indigenous flora.

Other factors %

Physical exertion, old age, alcoholism, pollution, exposure to toxic substances, seasonal factors, exposure to ionising radiation and extreme climates all have a profound effect on our friendly bacteria.

Every one of us carries a unique mixture of microbes in the gut. Under the influence of drugs and other factors, listed above, this gut flora will be changed in a unique way in every one of us, predisposing us to different health problems. It is a completely unpredictable process and the science so far has not got very reliable methods of testing for the full range of microbes in the gut, let alone treating any abnormalities. This damage gets passed from generation to generation as a newborn child gets its gut flora from the mother. And as the damage gets passed through generations, it gets deeper and deeper. This process reflects in the severity of healthproblems related to abnormal gut flora seen in generations. For example, this is quite a common scenario, which I see in my clinic: a grandmother has mild digestive problems as a result of low-key gut dysbiosis. She passes moderately abnormal gut flora to her daughter. On top of that she decides not to breast feed, because it is not fashionable. As a result, her daughter suffers from allergies, migraines, PMS and digestive problems. Then she takes contraceptive pills from the age of 16 which deepens the damage to her gut flora, not to mention a few courses of antibiotics along the way for various infections and a diet of fast foods. After 10 years of being "on the pill" she has children, to whom she passes her seriously abnormal gut flora. Her children develop digestive and immune problems, which then lead to eczema, asthma, autism and other learning problems.

Most of the factors, described here, are hard to escape in the modern world. Under the influence of these factors, the beneficial bacteria in the gut lose their ability to fulfil all the functions we have looked at in the previous chapters. They are unable to protect the digestive tract from opportunistic flora and transitional bacteria, viruses and fungi, which sets up a whole chain of pathology in the gut and the rest of the body. To gain more understanding of what happens in this situation, let us have a look at the opportunistic flora, which lives in our digestive system.

5. THE OPPORTUNISTIC FLORA

We talked in detail about the essential flora (the good bacteria) of the gut and its multiple functions. Let's look at the second group of bacteria now - the opportunistic flora. This is a large group of various microbes, the number and combinations of which can be quite unique. There are around 500 different species of them found in the human gut. These are the most common: *Bacteroids, Peptococci, Staphylococci, Streptococci, Bacilli, Clostridia, Yeasts, Enterobacteria {Proteus, Clebsielli Citrobacteria,* etc.), *Puzobacteria, Eubacteria, Spirochaetaceae, Spirillaceae, Catenobacteria,* different viruses and many others. Interestingly, many of these opportunistic bacteria when in small numbers and under control actually fulfil some beneficial functions in the gut, like taking part in the digestion of food, breaking down lipids and bile acids.

In a healthy gut their numbers are limited and tightly controlled by the beneficial flora. But when this beneficial flora is weakened and damaged, they get out of control. Each of these microbes is capable of causing various health problems. It is a fascinating area for future research, because it appears that it is the character of our individual opportunistic flora that may determine what disease we succumb to. Yes, we carry most of our future health problems in our own gut pretty much from birth. As long as we take good care of our defenders, the beneficial flora, those baddies may never show their ugly faces. Unfortunately, our modern life-styles sooner or later damage our indigenous bodily flora and whatever opportunists were waiting for their turn become active.

The best known is the fungus *Candida albicans,* which causes untold misery to millions of people. There is an abundance of literature published about **Candida** infection, so we will not concentrate on it here, However, I have to say that a lot of what is described as Candida Syndrome is in effect a result of gut dysbiosis (abnormal gut flora), which include the activity of lots of other opportunistic and pathogenic microbes. *Candida albicans* is never alone in a human body. Its activity and ability to survive and cause disease depend on the state of trillions of its neighbours - different

bacteria, viruses, protozoa, other yeasts and many other micro-creatures. In a healthy body *Candida* and many other disease-causing microbes are very well controlled by the beneficial flora. Unfortunately, the era of antibiotics gave *Candida albicans a.* special opportunity. The usual broad-spectrum antibiotics kill a lot of different microbes in the body - the bad and the good. But they have no effect on *Candida.* So, after every course of antibiotics *Candida* is left without anything to control it, so it grows and thrives. At the dawn of the antibiotic era the medical profession recognised this phenomenon, so it used to be a rule to prescribe Nystatin (an anti-candida antibiotic) every time a broad-spectrum antibiotic was administered. However, for whatever reason, doctors stopped this practise decades ago and now we are paying the price for it - **Candida** infection has become extremely common. Apart from antibiotics another factor in our modern world plays a major role in *Candida* overgrowth - our diet. *Candida* flourishes on sugar and processed carbohydrates and these are the foods, which nowadays dominate our western eating habits.

Some opportunists, listed above, when out of control get through the gut wall barrier into the lymph and bloodstream and cause problems in various organs in the body. But of course, the first place to suffer will be the digestive system. Holding an abnormal bacterial mass, it is no surprise that the digestive system cannot function well. The most common result of gut dysbiosis is the infamous Irritable Bowel Syndrome (IBS), where a whole host of opportunistic bacteria populate the intestines, causing the unpleasant symptoms of IBS. More and more research is coming out linking Crohn's disease and ulcerative colitis with the activity of opportunistic gut flora getting out of control.

Certain opportunists, when not controlled by damaged good bacteria, get access to the gut wall and damage its integrity, making it "leaky". For example, microbiologists have observed how common opportunistic gut bacteria from the families *Spirochaetaceae* and *Spirillaceae* have an ability due to their spiral shape to push apart intestinal cells, breaking down the integrity of the intestinal wall and allowing through substances which normally should not get through. *Candida albicans* has this ability as well. Its cells attach themselves to the gut lining literally putting "roots" through it and making it "leaky". Partially digested foods gets through this leaky gut wall into the blood stream, where the immune system recognises them as foreign and attacks them. This is how food allergies or intolerances develop. What is happening is that foods do not get a chance to be digested properly before they are absorbed through the

damaged gut wall. In many cases, when the gut wall is healed food allergies disappear.

Opportunistic flora constantly produces toxic substances, which are the by-products of their metabolism. In a healthy situation many of these by-products can be physiological because in the process of evolution they got included in the normal functioning of the human body. For instance, a well-known group of toxins, produced by gut bacteria are amines - the metabolites of amino acids. Many of them have some important roles to play in the normal physiology of the body. A good example is histamine - an important neurotransmitter in the body. Certain cells in the body normally produce histamine. However, it is also produced by *Proteus* family, *E. coli* family, *Staphylococci* and many other bacteria in the gut. In a situation where these opportunistic bacteria overgrow due to the lack of control from the beneficial flora, they start producing too much histamine. As histamine takes part in many different functions in the body, all these functions go wrong with the excess of histamine coming into the blood. These are the common symptoms of this condition: allergies, constantly low blood pressure, excessive production of body fluids, like saliva, dysfunction of hypothalamus with hormonal changes (PMS is a common result), emotional instability, sleep abnormalities, addictions and many others. An excess of histamine in the body is called histadelia. This condition was found by Dr Carl Pfeiffer in many people with depression, schizophrenia, addictions and autism. Antihistamine drugs are used by psychiatrists to treat schizophrenia. Nobody has yet looked at correcting the gut flora in order to normalise histamine production in the body and remedy symptoms of histadelia.

Other well studied amines: dimethylamine, piperidine, pyrrolidine, tyramine, octopamine, which are produced by bacterial activity in the gut from amino acids choline, lecithin, methylamine, lysine, arginine, ornithine and tyrosine, are also known to cause cerebral depression with symptoms of withdrawal, intellectual regression, behavioural and emotional abnormalities.

GAPS children and adults routinely show overgrowth of opportunistic microbes in their stool tests (the ones we can test for). The most commonly seen are *Candida albicans*, *Bacteroids*, *Clostridia spp.*, *Proteus* family, *Streptococci* and *Staphylococci*. Invariably, this overgrowth is combined with either the absence or greatly reduced numbers of beneficial bacteria. Unfortunately, stool testing so far available to us is quite primitive. There has not been a lot of money put into this research. There is a debate going on between professionals about the validity of stool analysis, as it only

shows what microbes may be in the lumen of the bowel. It gives no information on the most important inhabitants of the gut - the ones that live on the gut wall, the mural bacteria. These are the bacteria, which maintain gut integrity and its ability to digest and absorb food and which play such an important role in our immunity. There are limited studies done with biopsy of the gut wall and following microbiological analysis, which show that the mural bacteria can be quite different from the ones, which live in the lumen of the gut. Apart from that, stool analysis only reflects the microbial population of the bowel and does not reflect what lives higher in the intestines where the very important digestion and absorption happens. Unfortunately, we are still in the very early stages when it comes to testing for gut flora. Nevertheless, there is a large amount of information available now about what the bacterial population of a normal healthy person's stool should look like and compared to that information GAPS people have very abnormal results.

A group of opportunistic gut bacteria, called *Bacteroids*, routinely found in GAPS stool analysis, deserves some attention. It is the most ubiquitous opportunistic bacteria in the gut of adult population in the western world which may be explained by what these bacteria like to eat - sugar, starch, lactose - the backbone of the western diet. There are in excess of 22 different members of this family identified so far in the human body, the most common *Bacteroides fragilis* and *Bacteroides melaninogenicus*. These bacteria are almost always found in infected tissues of the digestive tract, abscesses, ulcers, urinary infections, lung infections, peritonitis, infected heart valves, blood infections, mouth infections, teeth and gum disease, gangrene and post-operative infections. They are opportunists always hanging around in every mucous membrane of the body waiting for their opportunity to cause trouble. However, they usually do not cause trouble alone but join some bigger bully on the playground and in that company really show their ability to cause disease. For example, they are usually found in company with *Clostridia*. They appear to be good friends with the *Clostridia* family, which is considered to be more dangerous than Bacteroids. But *Bacteroids* seem to show their ability to cause disease better in the company of *Clostridia*, at the same time assisting *Clostridiain* its activity.

Members of *Clostridia* family are almost always detected in the stool analysis of autistic children and adults. There are about a hundred of different *Clostridia* species known so far. Apart from autism they are present in the stools of people with schizophrenia, psychosis, severe depression, muscle paralysis and muscle tonus abnormalities and some other

neurological and psychiatric conditions. Many *Clostridia* species are normal inhabitants of a human gut. For example *Clostridium tetani* is routinely found in the gut of healthy humans and animals. Spores of this bacterium are passed through faeces into soils, where they can survive for years. Most soils in the world test positive for tetanus spores. Everybody knows that tetanus is a deadly disease, due to an extremely powerful neurotoxin *Clostridium tetani* produces. Anybody who gets a wound or even a scratch contaminated by soil is immediately advised to have a shot of anti-tetanus vaccine. But we contract tetanus only when the bacterium gets directly into our tissues or blood. *Clostridium tetani* which lives in the gut, normally does not do us any harm because its toxin cannot get through the healthy gut wall. GAPS patients do not have a healthy gut wall, which would allow toxins to get into the body.

Many other species of *Clostridia {perfringens, novyi, septicum, histolyticum, sordelli,aerofoetidum, tertium, sporogenes,* etc.), routinely found in the human gut, produce toxins similar to tetanus toxin as well as many other toxins. So how can we have these deadly bacteria in our gut and be healthy? Because, they are controlled by our friendly bacteria, which will not allow them to flourish and, most importantly does not allow their toxins through the gut lining into the bloodstream.

However, in the GAPS gut where the person hasn't got the beneficial bacteria to protect the gut wall and control *Clostridia,* neurotoxins have a good chance of getting into the bloodstream and into the brain and the rest of the nervous system, affecting its development and functioning. Sensitivity to light and noises is a typical symptom of tetanus infection and GAPS conditions, like autism, schizophrenia, psychosis, dyslexia, so it seems plausible that the two may be connected. Most GAPS children and adults, whom I see in my clinic, have got abnormalities of muscle tonus similar to low exposure to tetanus neurotoxin. A typical picture is where extensor muscles have higher tonus than contractor muscles. Maybe that is the reason why autistic children and adults walk on tiptoes and often self-stimulate by stretching their arms, fingers and legs in odd positions. In these cases where the patient's stool has been tested almost without exception an overgrowth of *Clostridia spp.* is observed. Recent research at the University of Reading in the UK by a microbiological team led by Professor Glenn Gibson has found very high levels of *Clostridia* in the gut of 150 autistic children and a second research programme found similarly high levels in the gut of another 80 autistic children, which were not present in their non-autistic siblings.

Just like *Candida albicans*, the *Clostridia* family was given a special opportunity by the era of antibiotics, because *Clostridia* are also resistant to them. So, every course of broad-spectrum antibiotics removes good bacteria, which leaves *Clostridia* uncontrolled and allows it to grow. Different species of *Clostridia* cause severe inflammation of the digestive system, for example *Clostridium difficile* causes a potentially fatal pseudomembranous colitis. Some species of *Clostridia* have been linked to such debilitating digestive disorders as Crohn's disease and ulcerative colitis. I have no doubt that the *Clostridia* family plays an important role in the development of autistic enterocolitis as well. Future research will show. However, there are some facts already which support this thought. For example, William Shaw at Great Plains Laboratories reports a number of cases where a course of anti-clostridia drugs Metronidazole (Flagyl) and Vancomycin reduced autistic symptoms and improved digestion and the biochemical picture in autistic children. However, in almost all cases as soon as the drug was stopped, all the symptoms and biochemical abnormalities returned. Unfortunately, anti-clostridia drugs are toxic, they have serious side effects, so we can not prescribe them for long periods of time to children or adults. *Clostridia* are spore-forming bacteria, which makes them impossible to eradicate. We can only control them and the best way to do it is Nature's way - with beneficial bacteria.

Another large group of bacteria, which commonly overgrow in the gut dysbiosis situation are **sulphate-reducing bacteria.** There are many species of sulphate-reducing microbes. To mention just a few: *Proteobacteria*, *Thiobacilli*, *Chromatiaceae*, *Desufotomaculum spp.*, some gram-positive bacteria, some fungi and *Bacteroids*. These microbes metabolise sulphate coming from food into sulphites, many of which are toxic. Severe deficiency in sulphates has been found in 95% of autistic children. Undoubtedly, sulphate-reducing bacteria play an important role in causing this deficiency. Sulphates are needed in the body for many functions, some of which are detoxification and normal metabolism of brain neurotransmitters. An overgrowth of sulphate-reducing bacteria would make sulphur unavailable for the body to use, turning it into toxic substances like hydrogen sulphide, which is the gas with a rotten egg smell. Many parents of autistic children tell me that their child's stool and flatus has this characteristic smell.

Here we have looked at some pathogens found in the gut of GAPS patients. To their happy company we can add the measles virus found by Dr A. Wakefield's research group. This is only one virus, which received

such detailed attention. There are some indications in literature that members of the **herpes** virus family are also very active in these patients. How many other viruses may there be in the GAPS gut, which have never been studied? How many other pathogenic bacteria, fungi, protozoa and other microbes are there, which we have no methods to detect or study yet? I have no doubt that sooner or later science will catch up with them and we will learn what they are and how to deal with them. In the meantime, what should we do to help our GAPS children and adults now? As always, Nature has a good answer - the beneficial flora. Having good bacteria in the gut is the best way to keep *Clostridia*, *Candida*, *Bacteroids*, viruses and many many other microbes under control. Well-functioning healthy gut flora would not only keep those pathogens down but would maintain the integrity of the gut wall so it does not let through the toxins from those pathogenic microbes. This is Nature's way of dealing with them and the smart thing for us is to try and copy it.

Due to the absence or greatly reduced numbers of beneficial bacteria, the GAPS digestive system gets taken over by opportunistic and pathogenic microbial flora, constantly producing a river of toxicity flowing from the gut to the brain. This is the toxicity, which is probably making these children and adults autistic, schizophrenic, hyperactive, dyspraxic, dyslexic, psychotic, depressed, obsessed, etc., etc.

We have already looked at some of these toxins. Let us have a look at more.

6. THE GUT-BRAIN CONNECTION

One only sees what one looks for,
one only looks for what one knows.

Goethe

Modern medicine has divided us, human beings, into different systems and areas: cardio-vascular system, digestive system, nervous system, etc. According to this division different medical specialities have been created, each concentrating on a particular bit of the human body: cardiology gastroenterology gynaecology neurology, psychiatry etc., etc. There is a reason for that. Medical science over the years has accumulated an enormous amount of knowledge. No doctor in the world can possibly know it all in detail, so specialising allows doctors to concentrate on a particular area of knowledge, to learn it thoroughly and to become an expert in that area.

However, from the early years of this specialisation many doctors have recognised a problem developing. A specialist in a particular area tends to pay attention to the organs, which he or she knows best, ignoring the rest of the body. The fact that every organ in the body exists and works in contact with the rest gets forgotten. The body lives and functions^as a whole, where every system, organ, tissue and even cell depend on each other, affect each other and communicate with each other. One should not look at, let alone treat, any organ without taking the rest of the body into account,

One area of medicine is particularly prone to look at its organ separately from the rest of the body. That area is psychiatry. Mental problems are examined from all sorts of angles: genetics, childhood experiences and psychological influences. The last thing that would be considered is looking at the patient's digestive system. Modern psychiatry just does not do that. And yet medical history has plenty of examples, where severe psychiatric conditions were cured by simply "cleaning out" the patient's gut. A renowned Japanese Professor Kazudzo Nishi has estimated that at least one in ten psychiatric conditions are due to self-intoxication coming from the bowel.

The vast majority of psychiatric patients suffer from digestive problems,

which are largely ignored by their doctors. The gut-brain connection is something which, for some reason, many modern doctors do not understand. As they give out millions of prescriptions for antidepressants, sleeping pills and other drugs, which the patients have to place into their digestive systems in order to affect their brains, they still fail to see the connection between the digestive system and the brain. Everybody knows what effect alcohol has on our brains. Where do we place alcoholic drinks? Into our digestive systems of course. However, we don't have to consume toxic substances to affect our brains. Having particular microbes in the digestive system can provide us with our own permanent source of toxicity.

As discussed in the previous chapters, a GAPS (Gut And Psychology Syndrome) person's digestive system becomes a major source of toxicity in the body. An unknown number of various neurotoxins are produced by abnormal flora in the gut of these children and adults, which get absorbed through the damaged gut wall into the blood and taken to the brain. The mixture of toxins can be very individual and this is one of the reasons why all GAPS patients are so different. As I mentioned, the number of different toxins is unknown. However, we have accumulated a considerable knowledge of some of the neurotoxins, commonly found in GAPS children and adults. These are the kind of toxins, which can make anybody mentally ill. In the previous chapter we looked at some of them. Unfortunately, there are more to examine.

Ethanol and acetaldehyde

Thinking about autism, ADHD, schizophrenia, dyslexia, dyspraxia and other psychological problems, not many people would think about alcoholism. And yet there is a very serious connection. We know that due to various factors GAPS children and adults develop an overgrowth of pathological flora in their bodies. One group of these pathogens, almost without exception, are yeasts, including *Candida* species. Yeast requires glucose as food. Glucose comes from the digestion of carbohydrates. In healthy people dietary glucose gets converted into lactic acid, water and energy through a biochemical process called glycolysis. In people with yeast overgrowth *Candida* highjacks the glucose and digests it in a different way, called alcoholic fermentation. In this biochemical process *Candida* and other yeasts convert dietary glucose into alcohol (ethanol) and its by-product acetaldehyde. This phenomenon was first described in adults, who appeared to be drunk without consuming any alcohol. Later on it was

found that these adults had an overgrowth of yeast in their gut, which produced alcohol and made them permanently "drunk". These people were particularly "drunk" after a carbohydrate meal, because carbohydrates get consumed by *Candida* with the production of alcohol. Despite the fact that these people did not consume alcohol, they developed some typical symptoms of alcoholism.

Alcohol and its by-products have a small molecular weight, which makes it very easy for them to cross any barrier in the body. They get absorbed into the blood very quickly and have a very good ability to get through placenta to a developing foetus. Pregnancy is a natural state of immune suppression. If a woman already has *Candida* overgrowth in her body, pregnancy would make this problem worse. Overgrowing yeast in a pregnant woman would produce alcohol and its by-products, affecting the child's development. After the child is born it will continue to get alcohol and its by-products through breast milk, which usually contains the same amount as the woman's blood. Then as the child inherits the mother's bodily flora, overrun by yeast, the child starts producing its own alcohol and many other toxins. Alcohol consumption and yeast overgrowth in fathers also has an effect on the child's development, so fathers with yeast overgrowth contribute to the problem as well. Indeed in my clinic more than 50% of fathers of autistic children suffer from abnormal gut flora and related health problems.

So what does alcohol and its by-products do to us? Everybody knows that alcohol is very toxic, particularly for a child. There is no^part of the body that will not suffer from the constant supply of alcohol even in tiny amounts. Here are just a few influences of chronic presence of alcohol in the body:

- Reduced ability of the stomach wall to produce stomach acid.
- Pancreas degeneration with reduced ability to produce pancreatic enzymes, which would impair digestion.
- Direct damage to gut lining, causing malabsorption.
- Nutritional deficiencies through malabsorption of most vitamins, minerals and amino acids. Deficiencies in B and A vitamins are particularly common.
- Damage to the immune system.
- Liver damage with reduced ability to detoxify drugs, pollutants and other toxins.
- Inability of the liver to dispose of old neurotransmitters, hormones

and other by-products of normal metabolism. As a result these substances accumulate in the body, causing behavioural abnormalities and many other problems.

- Brain damage with lack of self-control, impaired co-ordination, impaired speech development, aggression, mental retardation, loss of memory and stupor.
- Peripheral nerve damage with altered senses and muscle weakness.
- Direct muscle tissue damage with altered ability to contract and relax and muscle weakness.
- Alcohol has an ability to enhance toxicity of most common drugs, pollutants and other toxins.
- Alteration of metabolism of proteins, carbohydrates and lipids in the body.

Acetaldehyde is considered to be the most toxic of alcohol by-products. One of the most devastating influences of this chemical is its ability to alter the structure of proteins. We are largely made up of proteins; a myriad of various active substances from hormones to enzymes are proteins. When they are changed by acetaldehyde they can not do their jobs properly. Acetaldehyde-altered proteins are thought to be responsible for many autoimmune reactions, which means that the immune system starts attacking its own body. Antibodies against these acetaldehyde-altered proteins, which the immune system makes to destroy them, may also attack the normal proteins in the body with similar structure. Autistic children and schizophrenic patients are commonly found to have antibodies against their own tissues. One of the commonest is an antibody against a protein in a substance called myelin. Myelin is an integral part of the brain anatomy and the rest of the nervous system, coating brain cells and their branches, the nerve fibres. When myelin is damaged in adults it manifests itself as multiple sclerosis. There are some similarities in the neurological picture of autistic and dyspraxic children and patients with multiple sclerosis which may be due to acetaldehyde produced by the yeast overgrowth in these children.

Alcohol and acetaldehyde render a lot of essential nutrients useless in the body. For example, binding to proteins acetaldehyde causes functional deficiency of vitamin B6, which is a co-factor in production of neurotransmitters, fatty acid metabolism and many other functions in the body What is a functional deficiency? It means that the child may get plenty of vitamin B6 in the diet, but because acetaldehyde occupied the working sites of this

vitamin on proteins, it cannot do its job. So, it floats around the body in a rather useless fashion and eventually gets excreted. This may not happen just to vitamin B6 but to many other active substances in the body which have to bind to proteins in order to fulfil their purposes.

So, we talked about alcoholism in connection with children and young adults. Shocking, isn't it? What next?... Well, next we are going to talk about drug addiction.

Opiates from gluten and casein

Opiates are drugs, like opium, morphine and heroin, which are commonly used by drug addicts. What have they got to do with GAPS children and adults?

Gluten is a protein present in grains, mainly wheat, rye, oats and barley. Casein is a milk protein, present in cow, goat, sheep, human and all other milk and milk products. In the bodies of GAPS people these proteins do not get digested properly and turn into substances with similar chemical structures to opiates, like morphine and heroin. There has been quite a substantial amount of research done in this area by Dohan, Reichelt, Shattock, Cade and others, where gluten and casein peptides, called **gluteomorphins** and **casomorphins,** were detected in the urine of patients with schizophrenia, autism, ADHD, post-partum psychosis, epilepsy, Downs syndrome, depression and some autoimmune problems, like rheumatoid arthritis. These opiates from grains and milk are thought to get through the blood-brain barrier and block certain areas of the brain, just like morphine or heroin would do.

Why does this happen? The explanation is undoubtedly hidden in the person's digestive system.

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As we saw earlier GAPS patient's digestive system is in a poor state. The digestion of proteins starts in the stomach with the action of pepsin, a protein-digesting enzyme produced by the stomach wall. Stomach acid is essential for protein digestion, as it provides normal conditions for pepsin to do its work of breaking down proteins into shorter peptide chains. GAPS people commonly have low stomach acidity due to abnormal gut flora and overgrowth of pathogenic flora. For example, *Candida* alone can make toxins which have a strong suppressing ability on stomach acid production. These toxins would be excreted with breast milk in a mother with *Candida* overgrowth in her gut. It is possible that, while being breast fed, GAPS children receive these toxins from the mother through the breast

milk, which impair production of stomach acid from the very beginning of the child's life. As the breast milk requires virtually no digestion the child does not need much stomach acid while exclusively breast fed. But when other foods get introduced, the child's low stomach acidity becomes a problem. By the time the breast feeding stops the child's digestive system would probably have grown enough of its own *Candida* and other pathogens to produce toxins, which would carry on reducing the stomach acidity. The most usual weaning proteins first introduced to the child's digestive system are casein from formula milk and gluten from wheat. In a stomach with low acidity the first steps in the digestion of these and many other proteins would not go well. Then these maldigested proteins would be passed into the intestines, where pancreatic digestive enzymes are supposed to carry on breaking down proteins. Low stomach acidity would impair production of pancreatic enzymes, so the next step in protein digestion would also go askew. Next these maldigested proteins reach the final stage of their digestion - the intestinal wall. The intestinal wall is lined by highly sophisticated cells, called enterocytes which on their surface have got a whole host of different digestive enzymes to complete the final step s in the digestion of various nutrients. As we have already discovered in the chapter on the gut flora, in GAPS people these cells are in poor shape due abnormal gut flora. They are not able to accomplish these final steps in the digestion of casein, gluten and many other nutrients. As Dr J. Robert Cade from the University of Florida said in his interview with *Health Science Centre* in March 1999 "We think that with autism and schizophrenia, the basic disorder is in the intestine, and these individuals are absorbing beta-casomorphin-7 that they normally should break down in the body as amino acids, rather than peptide chains up to 12 amino acids long".

There has been some research published on one of the protein-digesting enzymes which sit on the enterocytes. It is called dipeptidyl peptidase IV (DPP IV) and it is supposed to brake down casomorphin and gliadomorphin into smaller peptides. GAPS children show deficiency in this enzyme. Interestingly, people, who suffer from alcoholism, schizophrenia, depression or autoimmune disease also have low levels of this enzyme due to the fact that in these conditions the patient's enterocytes are also damaged. Based on this research DPP IV is now added to some digestive enzyme formulations which can be supplemented to GAPS patients. The problem is that this is only one enzyme, which we have studied and know something about. How many more enzymes are there on the surface of enterocytes, which we know nothing or very little about at present? With the lack of

beneficial bacteria, which normally live on these cells, feed them, look after them and protect them, these cells fall ill and become unable to function properly As a result maldigestion and malabsorption set the scene In the GAPS gut. At the same time pathogenic bacteria, fungi and viruses damage the gut wall and allow maldigested proteins, like casomorphin and gliadomorphin, and other substances to be absorbed into the blood and carried to the person's brain.

There is another aspect to this problem. Normally proteins should be broken down into amino acids before they are absorbed in the gut. Apparently we all absorb some of our proteins in the form of peptides (partially broken down proteins) or even unchanged. These dietary peptides act as inhibitors of a special group of enzymes in the body, called peptidases, responsible for breaking down our neurotransmitters, hormones and many other active substances after they have performed their jobs. In GAPS patients these peptidases get severely suppressed by too many dietary peptides coming in, which floods the body with debris of our own inner peptides, which themselves can cause damage and psychological symptoms.

Based on the research into gluteomorphin and casomorphin a gluten- and casein-free diet (GFCF diet) was developed. Some autistic children show dramatic improvement on this diet. However, many children do not. The reason for that is that diere is much more to GAP Syndrome than gluteomorphins and casomorphins. So, for the majority of affected patients the diet has to take into account many other aspects of GAPS.

Other toxins

In the previous chapter we have talked about the *Clostridia* family and their toxins. *Clostridia* are difficult to study due to the fact that they are strict anaerobes. However, in his book Dr William Shaw describes in detail a number of autistic children who showed significant improvements in their development and biochemical tests while on anti-clostridia medication. Unfortunately, as soon as the medication was stopped the children slipped back into autism. As we have mentioned in the previous chapter, the best way to deal with *Clostridia* and many other pathogens in the gut is establishing proper healthy gut flora, as the beneficial bacteria are the natural way of controlling *Clostridia*.

Other frightening toxic substances have been found in autistic children by a biochemist Dr Alan Friedman. These chemicals are called deltorphin

and dermorphin. They were first found on the skin of poison dart frogs in South America where native people used to dip their darts into the mucous on these frogs in order to paralyse their enemy, because deltorphin and dermorphin are extremely potent neurotoxins. Dr Friedman believes that it is not the frog that produces these neurotoxins, but a fungus, which grows on the skin of this frog. It is possible that this fungus grows in the gut of autistic children. Hopefully, future research will elucidate this issue for us.

A number of other potent toxins have been identified and studied in GAPS people. To look at all of them is beyond the scope of this book. The important point is that GAPS children and adults are very toxic people. This toxicity comes from their digestive systems. So it is the person's digestive system we have to concentrate on first and foremost in order to treat the condition.

7. THE FAMILIES

Being a mother of an autistic child, I am very familiar with the feeling of guilt, which so many parents experience. We feel that we have done or haven't done something which caused our child's condition. It is a perfectly natural feeling and as parents we have to learn to deal with it as well as everything else our GAPS children bring into our lives. When we start reading and learning about what could have caused our child's condition on biochemical and physiological levels, we start feeling even guiltier. If only we could have avoided this and that and if only we could have done things differently, our child might have been different! In this chapter I am going to talk about the health of parents of GAPS children and how it could contribute to your child's condition. In no way do I want to make anybody feel guilty about it. We are what we are! Our children are physically made by us from whatever we are made of. Some of these things, like genetics, we are born with and there is nothing we can do about them. Some were given to us by our parents, like our bodily microbial flora and our eating habits. Some were created by our life-styles and choices. Some were imposed on us by our modern society and the world we live in. Most parents of GAPS children, I have met, rather than concentrating on their feeling of guilt, find a way of learning as much as possible about their children's condition and concentrating on what can be done about it

So, let's carry on learning!

As far as the science knows an unborn baby is sterile. Its body has no bacteria, viruses or fungi living in it. When the time of birth comes, as the baby goes through the birth canal, it gets its first dose of microbes. Its skin, eyes, mucous membranes in the mouth and nose acquire their first microflora. Through swallowing liquids in the mother's vagina the baby's digestive system gets its first population of bacteria, viruses and fungi. So, whatever lives in the vagina of the mother is what the baby would get.

Now, let's have a look at what lives in a mother's vagina. A healthy woman has a very large population of microbes in her vagina, called vaginal flora. Normally it is dominated by *Lactobacillus* species, namely *Lactobacillus acidophilus, Lactobacillus Casei, Lactobacillus Fermentum*

and others. These good bacteria keep the pH in the vagina quite acid, around 4-7, which does not allow other bacteria to take hold and grow. This normal flora in the vagina is absolutely vital for the woman's health. It protects her from infections, keeps the mucous membrane of the vagina and other organs in that area healthy, stimulates the production of large numbers of immune cells and immunoglobulins in the walls of the vagina to keep it well defended from any invaders. But when these good bacteria are damaged the problems start.

Let's see what can have a damaging effect on vaginal flora.

Antibiotics and other systemic antibacterial drugs have a direct effect on the composition of vaginal flora, because they destroy the beneficial bacteria in the vagina as well as everywhere else in the body. If the beneficial bacteria in the vagina are not there then the coast is clear for any invading bacteria, fungus, virus or parasite to take hold and grow. The pH in the vagina goes up and various aerobic, anaerobic and micro-aerophilic species start populating the woman's vagina, such as *Gardnerella vaginalis, Prevotella spp., Peptostreptococcus spp., Mycoplasma hominis, Ureaplasma urealyticum and Mobilincus spp.* causing inflammation with many very unpleasant symptoms. A well-known family of fungi, called *Candida albicans*, is a very common inhabitant of an unhealthy vagina, causing thrush. This fungus cannot live in a vagina with a good population of healthy bacteria.

The contraceptive pill has the same damaging influence on vaginal flora as antibiotics. Steroids in the pill have an ability to suppress the immune system and change the composition of bodily flora. Unfortunately, in our modem society women are put on the pill at a very early age and by the time they are ready to have children they have been taking these drugs on a regular basis for years, which would have a profound effect on the composition of their bodily micro-flora.

Many other drugs have a damaging effect on vaginal flora particularly steroids, sulphonamides, some non-steroid anti-inflammatory preparations and others.

Apart from drugs there are some other influences, which can change the composition of vaginal flora, for example poor diet, infections, personal care products and prolonged stress. But here we have to talk about the most important question: where does the vaginal flora come from?

The medical science shows that the flora in the vagina comes from the gut. What lives in the woman's bowel will live in her vagina. For example, in women with recurrent thrush, no matter how many powerful anti-fungal

topical preparations are used, the thrush always comes back. It comes back because the fungus, which causes it, called *Candida albicans,* lives in this woman's bowel. Until she gets rid of it in the bowel, she is not going to be free from vaginal thrush. But why does this woman have an overgrowth of fungi in her bowel? Because she does not have a healthy gut flora to protect her from this fungus and many other microbial invaders. This woman has a condition, called Gut Dysbiosis. She will not only have an overgrowth of *Candida albicans* in her gut but lots of other pathogenic microbes, causing many other health problems.

Amongst all the parents of GAPS children I have met, the mother always invariably has signs of chronic gut dysbiosis. Most mothers have been taking the contraceptive pill for years before having children. Many mothers have had numerous courses of antibiotics. Many of them have not been breast fed as babies and their mothers show typical symptoms of gut dysbiosis. Almost every one of them has one or more health conditions which are typically associated with abnormal gut flora. The most common health problems, which mothers of GAPS children suffer from are: digestive disorders, asthma, eczema, hay fever and other allergies, migraines, PMS, arthritis, skin problems, chronic cystitis and vaginal thrush. These conditions seem to be unrelated, but they are all children of one parent - Gut Dysbiosis.

What about fathers? In many cases fathers of GAPS children also suffer from digestive problems, asthma, eczema, migraines and skin problems which indicates that they do not have a normal gut flora. Of course the father is a great contributor to a mother's vaginal flora through regular sexual contact. In fact in those rare cases when the mother did not show any signs of gut dysbiosis the father was severely affected by it. Having abnormal gut flora the father would have abnormal flora in the groin, which he would regularly share with his wife. Then the wife would pass that flora to the baby at the time of birth.

So, what happens after the baby is born? The most important thing that should happen is breastfeeding. Breast milk, particularly colostrum in the first days after birth, is vital for appropriate population of the baby's digestive system with healthy microbial flora. It is known that bottle-fed babies develop completely different gut flora to the breast-fed babies. That flora later on predisposes bottle-fed babies to asthma, eczema, different other allergies and other health problems. We all know that breast is the best! However, most things that are floating in a mother's blood will be in her breast milk. A mother with abnormal gut flora would have a whole host of

toxic substances, which are produced by pathogenic microbes in her gut andmaldigested foods absorbed into her bloodstream. These toxins will be excreted in her breast milk and fed to her baby. In particularly severe cases mothers of GAPS children could not breastfeed their babies because the baby would refuse the breast or just fall asleep after the first few mouthfuls of the breast milk. We know that some of the toxins, which are produced by abnormal gut flora, have the chemical structure of opiates, like morphine and heroin. If the baby gets these opiates in the breast milk then it is quite understandable why the baby falls asleep after the first few mouthfuls. Another reason for the baby to refuse breast is milk allergy. In a woman with gut dysbiosis the gut lining is damaged and leaky. It allows through partially digested proteins and antigens. Milk antigens have been detected in breast milk. I have seen a few cases when the baby took to the breast after the mother removed dairy foods from her diet. A lot of cases of severe eczema in babies can also be relieved by this measure.

On the positive side, however, the mother would also develop antibodies to her pathogenic flora in the gut. These antibodies too will be excreted through her milk and fed to her baby. So, if the baby has inherited abnormal gut flora from the mother, this flora will be controlled by antibodies in the breast milk while the baby is breastfed. When the breastfeeding stops, however, this protection stops as well. A lot of parents of GAPS children can time the start of health problems in their child to the time of stopping breastfeeding: ear infections, digestive problems, eczema, etc. It is possible that the baby has developed an abnormal gut flora, which was controlled by antibodies in breast milk, so its own immune system has not developed any protection against this abnormal gut flora. On the contrary, there is a lot of evidence to suggest that the baby's immune system accepts these pathogenic microbes in the gut as something normal because that is all it has known from the beginning and it does not recognise these microbes as foreign and does not attack them As a result after the breast feeding stops there is an explosion of growth of abnormal bacteria, viruses and fungi in the baby's digestive system. In different children it takes a different length of time, depending on the individual composition of the gut flora, severity of gut dysbiosis and the diet of the child.

Coming back to the health of the parents of GAPS children, when I ask questions about the health of their child's grandparents, particularly on the mother's side, it becomes obvious that we have generations of people with compromised gut flora. This damage becomes deeper in every generation. The era of antibiotics, contraceptive pill, breast feeding going out of

fashion arid drastic changes in diet have all contributed to this phenomenon. Doctors have known for centuries that unhealthy parents produce unhealthy children. Mother's body is a home for the growing baby for nine months and a source of nourishment and care for months after the birth. So, mother's health is particularly important for the health of the baby. In our modern society we have generations of women, whose health has been compromised by our modern life-styles. Should it, therefore come as a surprise to us that we have epidemics of autism, ADHD, dyspraxia, dyslexia, asthma, eczema, allergies, diabetes and many other health problems in our children?

There is another important factor, which makes children vulnerable - the toxic load which the child is born with. What is it? For years we believed that the placenta in a pregnant woman protects the foetus from any toxins which the woman might have in her body. Recent studies show that we were wrong. The foetus accumulates most toxins, which the mother is exposed to. Mercury from amalgam fillings, toxins coming from food and environment and toxins produced by abnormal gut flora in the mother have a good chance of accumulating in the foetus. Depending on how toxic the mother is during pregnancy different babies are born with a different toxic load. A baby with a high toxic load will start its life at a disadvantage being more vulnerable to various environmental influences: vaccinations, infections, food, drugs, etc. That is why the old wisdom of treating pregnancy with respect is so important. A pregnant woman has to be extremely careful what she puts into her mouth and on her skin. A good quality diet, plenty of rest, plenty of clean, fresh air and gentle physical activity in the fresh air are all vitally important. Protecting pregnant woman from exposure to any man-made chemicals, tobacco smoke, radiation, drugs, etc., will help her produce a child with a low toxic load in its little body, which will give it a good start in life.

What about other children in the family? In my clinical experience the siblings of autistic, hyperactive and other GAPS children are almost invariably affected by abnormal bodily flora and conditions, which are caused by it. The most common ones are eczema, asthma, digestive problems and anaemia. Less common are attention deficit with or without hyperactivity, dyspraxia, dyslexia and autism. Of course, these children have inherited the same flora as their GAPS sibling. But due to genetic differences, a different toxic load at birth and various other factors, their bodily dysbiosis and toxicity, which it produces, manifests itself differently. Well-functioning gut flora is the major regulator and housekeeper of our immune

system. Allergies, like eczema and asthma are the result of a malfunctioning immune system and the most common conditions I see in the siblings of autistic children, for example.

Different digestive problems are usually not as severe in the siblings, as in their GAPS brother or sister. Nevertheless, they are quite common, which is not surprising considering that they got their gut flora from the same mother as their more severely affected sibling.

Anaemia is something that is not readily recognised in connection with autism, eczema, asthma, ADHD, schizophrenia and other GAPS disorders. And yet the majority of GAPS children, I have seen, look pale and pasty and their blood tests show typical for anaemia changes. However, when you look at mothers and siblings of these children, they almost without exception look just as pale and pasty. The reason for that is that most people with abnormal gut flora have various stages of anaemia. We have already discussed why it happens in the previous chapters. Here I would just say that anaemia, even mild, is not something to be taken lightly as it comes with a constant feeling of tiredness, lack of energy and stamina, difficulties in concentration, completing daily tasks and learning.

On the whole, having met many families with GAPS children, I usually find that the whole family needs treatment. The most fundamental purpose of treatment has to be normalising the gut flora and addressing nutritional deficiencies. As the whole family gets healthier, the parents have more energy and stamina to deal with their child's problems and to bring up their other children. Afamily is alivingorganism and has to be seen and treated as a whole. In our struggle to help our GAPS children it is very easy for us, parents, to neglect ourselves. But, at the end of the day a strong healthy family is what we are all about. Isn't it?

8. VACCINATIONS
DOES MMR CAUSE AUTISM?

The human mind is like an umbrella -
it functions best when open.
Walter Gropius, 1965

Talking about autism it is impossible to avoid the issue of the MMR vaccine and vaccination in general. In my practice I see some parents of autistic children who would link their child's disorder with the MMR (Measles, Mumps and Rubella) vaccine where a majority cannot make this connection. An equal number of families connect their child's regression with DPT (Diphtheria, Pertussis and Tetanus) vaccination. Following research by Dr Wakefield there has been a lot of publicity on this subject. The British government has put a lot of effort and money into convincing the public that the MMR vaccine is safe. While the MMR vaccine was in the limelight, other vaccines got questioned as well, due to the fact that many of them contain a preservative Thimerosal, a Mercury compound, and many other toxic and questionable substances. DPT vaccine containing Thimerosal has been banned in many countries. However, in Britain a fair amount of old stock, containing Thimerosal, may still be injected into babies. Many vaccines are new and have not been tested long enough, yet apparently the number of complications from these vaccines is much higher than anybody would expect. On top of all this we have to remember that vaccines are commercial products made with profit in mind. Is it true that the £3 million, which the UK government recently spent on MMR promotion, was paid by the companies who have a commercial interest in this vaccine?

So, does MMR cause autism?

I do not believe that things are that simple. Here we have to look at vaccination as a whole.

Let us have a look at what is happening to children in our modern society. If you look around, how many healthy children do you see? Childhood asthma, eczema, diabetes, allergies, hay fever, digestive disorders, ADHD and autistic spectrum disorders have all gained epidemic proportions! The majority of siblings of autistic children have eczema, asthma or another one of those disorders. And though all these health problems appear to be different, they have one thing in common. A very big thing - a

compromised immune system. A compromised immune system is not going to react to environmental insults in the normal way! Vaccination is a huge insult to the immune system. The manufacturers of vaccines produce them for children with normal immune systems which will react to these vaccines in a predictable way. However, in our modern society with our modern way of life, we are rapidly moving to a situation where a growing proportion of children do not have a normal immune system and will not produce an expected reaction to the vaccine. In some of these children vaccination, putting an enormous strain on an already compromised immune system, becomes that "last straw which breaks the earners back" and brings on the beginning of autism, asthma, eczema, diabetes, etc. In other children, whose immune system is compromised to a lesser degree, vaccination will not start the disorder, but it will deepen the damage and move the child closer to it.

So while MMR and othervaccines maynotbe the direct cause of autism, in immune-compromised children they can do a lot of harm and in some children may well provide the trigger which starts the disorder.

Following all the scandals around vaccinations it is no surprise that a lot of people around the world express an opinion that we should abandon childhood vaccinations altogether. What these people forget is that before the vaccination era it was quite normal for every family to loose one, two, three and sometimes even more children to childhood infections, like measles, rubella, mumps and others. This is the natural selection law, which Mother Nature has imposed on all living creatures on Earth. No animal would have all of its young survive. In fact in many species most babies in the litter die with only the strongest surviving. This law of natural selection ensures that the planet is populated by the best and the fittest in each species. In our modern world we humans are not prepared to obey this law. No mother would allow her child to perish, when there are ways to let the child live, despite the fact that this child may not be the best and the fittest she can produce. Childhood infections are one of the tools of natural selection. Children, who survive them, come out healthier with stronger immune systems, weak children are not supposed to survive them. Vaccinations are one of those ways we humans have invented to allow our weaklings to survive. So, we cannot abandon vaccinations altogether unless we are prepared to obey the laws of Nature. We have to come up with a more rational approach to vaccinations.

Vaccinations, which saved the lives of millions of children world-wide in the last century, are becoming dangerous thanks to changes in our

life-styles. The number of immune-compromised children in developed countries is enormous and growing every day. It is time for the medical profession and governments to review their attitude to vaccinations. The rule to vaccinate everybody has to change!

In this book I propose the following procedure: a comprehensive immunological survey should be performed with every baby before a decision about vaccination be made. This survey should include:

1. A questionnaire to assess the health history of the parents and the infant.
2. A comprehensive stool and urine analysis to assess any risk of gut dysbiosis in the baby.
3. Test to assess the infant's immune status.

These questionnaires and tests have to be put into an appropriate pre-vaccination panel for all babies and the results of this survey have to be an essential part in the process of deciding which of the following steps to take:

- No vaccinations at all. An infant born to a mother with ME, fibromialgia, digestive problems, asthma, eczema, severe allergies, auto-immune disorders or neurological problems should not be vaccinated. An infant presenting with eczema, asthma, digestive problems or any other disorder, which would indicate compromised gut flora and immunity, should be a red flag not to vaccinate! Younger siblings of autistic children, children with severe eczema, asthma, allergies, ADHD, epilepsy and insulin dependant diabetes should not be vaccinated. At the age of five years these children can be re-tested and in those cases where the child does not have immune deficiencies vaccination with single vaccines only may be considered. These single vaccines should be spaced by at least six weeks from each other.
- Delayed vaccination until the results of the tests are better. This would apply to infants who have generally healthy mothers and do not present with any particular health problems, but on testing show abnormalities in their immune systems. These children should be re-tested every six to eight months and vaccinated with single vaccines only when they are ready.
- Standard vaccination protocol with single vaccines only. This would apply to healthy infants who have healthy parents and whose tests show normal immune development.

These are just initial guidelines, which need to be worked on in order to set an appropriate vaccination protocol. Those £3 million which the British government spent on promoting MMR might have been just enough to develop such a protocol, and, in my opinion, be a much more worthwhile investment in the future health of our nation.

Concerning our current standard vaccination protocol there is a strong argument to administer single vaccines only rather than combined vaccines, like MMR and DPT. In a natural situation a child would never be exposed to measles, mumps and rubella at the same time. Indeed, in those extremely rare occasions in history when two of these infections happened at the same time the medical literature describes impaired physical and mental development in the child. Of course the proponents of the combined vaccines would say that millions of children around the world were vaccinated this way without any ill effects. However, in view of GAPS conditions reaching epidemic proportions we have to review our old policies. It is very likely that combined vaccines will have to be abandoned altogether.

9. SCHIZOPHRENIA

Schizophrenia is that big bag, where psychiatrists put all the patients who are difficult to understand. There is a considerable overlap between depression, bipolar disorder, obsessive-compulsive disorder, dyslexia and schizophrenia. Quite often a patient would be diagnosed as bipolar to be later re-diagnosed as schizophrenic. Depression is often the only symptom present in a patient for years before other symptoms of schizophrenia develop. Members of the family of a schizophrenic patient often suffer from dyslexia, dyspraxia, depression, bipolar disorder, autism, ADHD and obsessive-compulsive disorder. Just as it is with childhood learning disabilities we see that psychiatric patients do not fit neatly into our diagnostic boxes. Is it because we are missing some underlying problem, which may be causing all these different conditions in different people?

The only treatment modern psychiatry can offer schizophrenic patients are antipsychotic drugs. The use of these drugs is often based on trial and error and though in many cases they do control psychotic symptoms, they have serious side effects and do not cure the patient. Like most drugs, used in modern medicine, they are symptomatic, which means that they only reduce the symptoms without treating the disease. On average antipsychotic drugs reduce symptoms only by 15-25 %, which means that 75-85% of symptoms are left unresolved.

Before the era of pharmaceuticals ruling medicine, psychiatrists routinely recorded that psychiatric patients not only have psychiatric problems, but are also very ill physically. The most common physical problems are digestive, cardio-vascular, diabetes, lung and urogenital infections, autoimmunity and other signs of immune abnormalities. In an old *Textbook of Psychiatry* by Henderson and Gillespie, published in 1937, it is clearly stated: "A thorough physical examination is absolutely essential in every case - schizophrenics are commonly poorly nourished". Recent research proves it to be correct. Deficiencies in vitamins (such as niacin or B3, B6, B12, Bi, folic acid, vitamin C) and many minerals (such as magnesium, zinc, manganese, etc) are routinely recorded in schizophrenic patients. A Canadian doctor Abram Hoffer has successfully treated thou-

sands of schizophrenic patients with supplementation of **B3, B12,** folic acid and vitamin C. An American doctor Carl Pfeiffer has studied more than **20,000** patients and showed that treating them with nutritional supplementation and diet can be far more effective, than using prescription drugs.

Why do schizophrenic patients have nutritional deficiencies? We already know that the answer will be found only in their digestive systems. A French psychiatrist Pinel almost **200** years ago wrote, "the primary seat of insanity generally is in the region of the stomach and intestines". US Professor Curtis Dohan, MD, devoted many years to researching what connection digestive abnormalities in schizophrenic patients may have with their psychological state. It had been noticed previously that there is a considerable overlap between coeliac disease and schizophrenia and Dr Dohan found that symptoms of schizophrenia could be dramatically relieved by cutting all grains out of the diet. He also found that some cultures in the South Pacific, which never consumed grains, had no schizophrenia. Only when they adopted a western diet full of grains did they start getting cases of schizophrenia. Another good example is Ireland, where people did not consume wheat until the potato famine in 1845. Before then there were no cases of schizophrenia or coeliac disease recorded in Ireland. Since adopting wheat as a staple food Irish have one of the highest incidences of coeliac disease and schizophrenia in the world. In the late **1970s** it was discovered that gluten from grains and casein from milk can be turned into opiates in the digestive system, which absorb into the blood, cross the blood-brain barrier and affect the brain. These opiates were found in the urine of schizophrenic patients and those with depression and autoimmune conditions. Later on Dr Reichelt in Norway and Dr Shattock in the UK found the same compounds in the urine of autistic children. That is how schizophrenia and autism found themselves in one company It became clear that both groups of patients could not digest gluten from grains and casein from milk.

Schizophrenic patients usually develop psychotic symptoms in their teens or early twenties. However, when I talk extensively with the parents of these patients, a picture of GAPS emerges. Mothers of these patients almost invariably have abnormal gut flora and associated disorders. It means that she would pass her abnormal flora to her baby. A large percent of schizophrenic patients were not breastfed as babies, which would further compromise their digestive flora and immune system. From the childhood health history it becomes clear that the patient was physically

ill long before developing psychotic symptoms. Digestive problems, allergies and reactions to food, eczema, asthmatic episodes, malnourishment, lack of stamina, hyperactivity, attention deficit, dyspraxia, dyslexia, fatigue, irritability, poor sleep, night terrors are all common. All these symptoms indicate, that the child had abnormalities in gut flora with all the usual consequences: malnourishment with multiple nutritional deficiencies, compromised immunity and toxicity, coming from the gut. A mixture of these toxins obviously was not right for making the child autistic for example, but was enough to cause other problems. In these cases schizophrenia does not come from nowhere, it comes out of GAPS.

Seeing that schizophrenic symptoms usually appear around puberty it is reasonable to suspect that puberty plays some role in the onset of schizophrenia. It is possible that the hormonal turmoil of puberty in some way interacts with the toxins in the child's body and tips the child into a psychotic state. It is also possible that the hormones open the blood-brain barrier for some of the toxins, which were in the child's body al] his/her life, but could not get into the brain before. Another interesting possibility is something wrong happening in the maturation processes of the brain. Apparently through different stages of growth the brain prunes its receptors. The most active pruning goes on around two years of age and at puberty. It is possible that at puberty opioid peptides and other toxins escaping the gut of the youngster interfere with this natural pruning process and tip the brain into psychoses. Hopefully, future research explain these issues. What is obvious is that psychotic manifestation is only a progression of the physical problems in the child's body and not a new disease appearing out of nowhere!

The toxicity produced by abnormal microbial mass in the patient's digestive system affects the brain and causes the symptoms of schizophrenia. So, in order to help the patient we need to get rid of this toxicity In order to do that we need to treat the patient's digestive system.

In my clinical experience the same nutritional management, as I prescribe for GAPS children, works very well for schizophrenic patients. I believe this happens because this nutritional management heals the gut lining and re-establishes normal gut flora. As a result, the patient starts digesting and absorbing food properly. The gut stops being the major source of toxins in the body and becomes the major source of nourishment, as it is supposed to be. As the nutritional deficiencies and toxicity go away the psychotic symptoms go away with them.

What about the medication?

This is a very important point that has to be taken into account. It is very rare to see a psychiatric patient, who is not taking anti-psychotic medication. Anti-psychotic drugs change the biochemistry of the brain and, according to the latest research, even the structure of the brain. Recent publications in the *Lancet* and the *American Journal of Psychiatry* suggest that long-term use of neuroleptic drugs cause brain atrophy (shrinkage). It is not known yet whether these changes are reversible. On top of that, anti-psychotic drugs have got a long list of unpleasant side effects and in essence are toxic. So, it is a logical desire of any patient to come off the drugs as soon as possible. However, as we detoxify the patient through nutritional management it is important not to change his/her medication until the patient is ready for it. I will explain why. When we are sure that through diet and supplementation the patient's physical and mental state has dramatically improved and is stable, we can consider removing the medication. Despite the fact that the pharmacological companies, who produce neuroleptics, allow to stop these drugs abruptly, there is a considerable amount of published clinical evidence to show that ami-psychotic drugs must be removed very slowly and very carefully. Sudden removal of these drugs can cause a severe withdrawal reaction because the brain's biochemistry and structure need time to re-adjust to life without the drug. When the drug is stopped abruptly, unfortunately, the withdrawal reaction is very often seen as a relapse of the disease itself and the patient is promptly put back on the drugs. It is vitally important to work closely with the patient's psychiatrist in order to reduce the dose of the drug very slowly and very gradually in order to avoid the withdrawal reaction. Depending on the dose of the drug and how long the patient was taking it, this period can take months, sometimes years (if the patient was on a cocktail of drugs). Typical symptoms of withdrawal are to be expected in this period: nausea, vomiting, absence of appetite, headaches, lethargy, lack of energy, sleep disturbances and mood swings. One of the side-effects of a lot of neuroleptic drugs is weight gain and water retention. So, weight loss is also to be expected on withdrawing these drugs. Though the weight loss can be quite rapid it usually comes down to the normal range for the person and should not cause any particular worry.

I would like to emphasise again that it is important to build up the patient nutritionally first and remove the cause of the problem - the GAPS - before starting the process of drug withdrawal. It is very important for the

patient and his/her carers to understand that in this period of drug withdrawal it is vital to stick to the GAPS Nutritional Programme rigidly! This is not a good time to be relaxed with diet and supplementation! After the drugs have been safely removed and the patient has been stable for at least a year on an occasional basis different foods (not allowed on the GAPS diet) can be tried, but not earlier.

Pellagra

There is a certain group of schizophrenics who may be not schizophrenics at all but pellagrines. Pellagra is a deficiency of vitamin B3 (niacin or niacinamide). The typical symptoms of pellagra can look very much like schizophrenia: delusions, hallucinations, confusion, headaches, anxiety, depression, irritability with a lot of physical symptoms: dermatitis, chronic diarrhoea and inflammation of mucous membranes. It used to affect poor populations whose diet was mainly corn-based. Until the real cause of this disorder was discovered pellagrines were treated almost like lepers. People believed that pellagra was infectious and contagious until it was discovered that a diet rich in vitamin B3 completely cures it, A Canadian psychiatrist Dr Abram Hoffer has helped thousands of patients with schizophrenia by simply supplementing their diet with large doses (2-4 g a day) of vitamin B3. Later on he added vitamin C and some other nutrients to his treatment protocol.

The GAPS nutritional protocol will supply the patient with a lot of vitamin B3. However, based on Dr Hoffer's research I believe that schizophrenics, apart from following the GAPS Nutritional Protocol for the first few weeks should supplement vitamin B3: niacin or niacinamide, 1-2 grams twice a day. Niacin causes flushing of the skin for 15-25 minutes. This is a benign reaction and should not alarm the patient. If it is a problem then "non-flush" niacin is available. It is always best to administer treatment under professional supervision.

On the whole there is a general opinion that schizophrenia is incurable. That is what the patients and their relatives are usually told at the time of diagnosis. However, according to the experience of doctors, like Abram Hoffer, Curtis Dohan, Carl Pfeiffer and many other medical practitioners, who treated their patients with nutrition, schizophrenia is not incurable at all. There are thousands of patients around the world who recovered completely through using appropriate diet and nutritional supplementation. Nutritional treatment is the way forward for these patients and more and

more psychiatrists are becoming aware of it. However, the way official psychiatry is presently organised, it is the patients and their families who have to administer nutritional treatment. It is not an easy undertaking, but extremely rewarding. As one of my patients said recently: "You were right about the diet! I feel absolutely normal now. I am going to stick to my diet and supplements religiously!"

PART TWO: TREATMENT

The art of medicine consists in amusing the patient while nature cures the disease.
Voltaire

A human body has an incredible ability to heal itself, given the right help. It is particularly true for children. I do not believe, that any child, no matter how ill or disabled is beyond improvement. When working in neurosurgery it never ceased to amaze me, how remarkably well children's brains recover after some serious operations, when large parts of the brain were removed. The child would leave the hospital in a wheelchair and then come back for a yearly check-up with hardly any neurological deficit detectable.

However, Nature does not work fast. It can be very fast getting ill, but to recover always takes much longer. I tell the parents of GAPS children and carers of GAPS adults to brace themselves for at least two years of hard work. In some GAPS patients it takes longer. The purpose of the treatment is to detoxify the person, to lift the toxic fog off the brain to allow it to develop and function properly. In order to achieve that we need:

First; To clean up and heal the digestive tract, so it stops being the major source of toxicity in the body and becomes the source of nourishment, as it is supposed to be. Second: To remove toxicity, already stored in various tissues of the patient's body

These two targets are achieved by means of The Nutritional Programme. This programme has evolved through the personal experience with my own child and clinical experience with hundreds of GAPS children and adults in the UK and other European countries.

So, what does this programme involve?

The Nutritional Programme for Gut and Psychology Syndrome

1. Diet.
2. Supplementation.
3. Detoxification and life-style changes.

In the next chapters we are going to look in detail at these three points. However, apart from the nutritional programme there is another intervention, which is extremely important to implement, particularly with

children. This intervention is an appropriate education. It is beyond the scope of this book to discuss education. However, this is an important point to make: as the child starts to detoxify with the use of the nutritional programme he or she will be more capable of learning. Teachers and parents frequently comment on how much faster the child starts to progress through his or her educational programme when the GAPS nutritional protocol is implemented.

DIET

I. THE DIET - A DISCUSSION

Nowhere there is so much misunderstanding and confusion, as on the subject of diet. At one end of the spectrum there are plenty of medical professionals and other people, involved in caring for people with autism, schizophrenia, ADHD and other GAPS conditions, who will tell you that diet has nothing to do with these problems. At the other end of the spectrum there are a few books, mainly written by parents, about the miraculous effects of dietary changes on their children's condition. In between there are many families who have tried various dietary interventions with different results: from no effect to some improvement.

The amount of different information available on the diet for autism alone must be bewildering for the parents. The most heavily promoted is the gluten-and casein-free diet. Then there are diets without salicilates and phenols. The anti-candida diet has to be taken into account, as GAPS people are without doubt affected by this yeast. Food allergies and intolerances are a big issue for many GAPS children and adults. And, as if all that is not enough, many parents of GAPS children have to battle with the fact that their child will eat hardly anything, as majority of GAPS children are so finicky with food. Consequently it is no surprise that many families try different dietary interventions for a while, see no results and drop the whole idea, joining the camp of cynics.

There is no doubt that appropriate diet is of paramount importance in treating any chronic degenerative disorder, including GAPS. But what diet?

Before we start talking about what is the appropriate diet for GAP Syndrome, we need to clear up some misunderstandings.

The Gluten and Casein Free Diet

In the previous chapter we talked in detail about research, done by Dohan, Reichelt, Shattock, Cade and others, where gluten and casein peptides,

called gluteomorphins and casomorphins, were detected in the urine of autistic children, patients with schizophrenia, psychosis, depression, ADHD and some autoimmune disorders. These peptides have a similar chemical structure to opiate drugs and are thought to effect the brain in a similar fashion. The Gluten Free and Casein Free diet (GFCF diet) is based on this research. This diet has been very heavily promoted and has almost become the official diet for autism. Let us have a look at it in detail.

Gluten is a protein found in grains, mainly wheat, rye, barley and oats. Casein is a protein found in milk and milk products. GFCF diet aims to remove all sources of these two proteins. The theory behind this diet is sound, the problem is the application. Autistic children due to abnormalities in their gut flora crave processed carbohydrates - the very foods that feed pathogens in their gut. The typical pattern of autistic development includes the fact that somewhere in the first two years of life the child limits his/her diet to processed carbohydrates, dairy and sugar: breads, biscuits, cakes, sweets, crisps, breakfast cereals, pasta, milk and sweet yoghurts. In the majority of cases it is extremely hard to change the child's food preferences: he/she just would not accept any other foods. So, to transfer this child to GFCF diet, processed carbohydrates containing gluten get replaced with gluten free processed carbohydrates, made with rice, sugar, potato starch, tapioca flour, soy, buckwheat flour, etc. This sort of foods will feed the abnormal flora in the child's gut just as much as the previous diet did, perpetuating the vicious cycle of a damaged leaky gut and toxicity escaping from this leaky gut into the blood and brain. Of course, the fact that out of dozens of various toxins, flowing from the gut into the body, two toxins have been removed: gluteomorphin and casomorphin, does some good. In some children it has quite a noticeable effect. But unfortunately in the majority of cases it has very little or no effect at all, because the rest of the toxicity is still there, being produced by abnormal gut flora. As long as *Candida, Clostridia* and many other pathogens populate the gut, the inflammation will persist, the gut will stay leaky, allowing hundreds of different undigested and toxic substances into the body.

The fact that this kind of GFCF diet gained such a world-wide acceptance as *the diet for autism* is very unfortunate, because it addresses only a small part of the whole picture of autism: the gluteomorphins and casomorphins. As it always happens a lot of commercial companies jumped on the bandwagon, ready to supply GFCF pre-prepared foods, full of sugar, processed carbohydrates, denatured and altered fats and proteins and many other substances, which autistic children must not have. Every pub-

lication on autism is full of advertisements for these foods, lulling the parents into a sense of false security: if it is GFCF it must be fine for my autistic child. Books are written full of recipes, based on these processed carbohydrates, sugar, altered fats and proteins. Web-sites and internet chat groups have been set up exchanging the same kind of recipe....

This is just another example of what already happened many times in our human history: scientific data has been used the wrong way. There is no doubt, that gluten and casein are better out of the diet of an autistic child. But these two substances are by no means the one and only decisive key to autism, schizophrenia and other GAPS conditions. The core issue, which we have to deal with, is the unhealthy gut ruled by abnormal microbes. An appropriate diet is an absolutely essential part of the treatment. But it is definitely not the GFCF diet, as we know it.

Phenols and Salicylates

There is a theory that GAPS children and adults react to phenols and salicylates (a subgroup of phenols), so foods containing them should be out of their diet. Proponents of this theory advise to cut out pretty much all fruit, vegetables, nuts, seeds and oils. I don't know why they stop there because there is no food on this planet, which does not contain phenolic compounds. All grains, meats, fish, eggs, milk, fruit, vegetables and plant matter are full of phenols.

Phenols are aromatic substances of small molecular weight. They give our foods their colour and flavour. They preserve foods in their natural state by protecting them from pathogens. They take an active part in germination and growth of seeds and attract flower pollinators. They act as powerful antioxidants and detoxifiers, when introduced into our bodies. Many nutrients and active substances essential for us to have every day are phenols. Let's just look at some of them.

- Vitamin C. Nobody can live without it.
- Vitamin K. Essential in blood clotting and many other bodily functions.
- Vitamin E. Essential for brain development and hundreds other jobs in the body.
- Vitamins Bi (thiamin), B2 (riboflavin), B3 (niacin), B6 (pyridoxine), folic acid are phenols. All these vitamins are essential for us to have every day if we are to be alive at all.

- Amino acids - cholin, phenylalanine, tryptophan and others. Without them we would not be able to produce neurotransmitters for our brain and the rest of the nervous system.
- Some neurotransmitters themselves: dopamine, norepinephrine, histmine are also phenols.
- Gallic Acid. Cutting out this phenol is the basis of Feingold Diet or low salicylate diet. Gallic acid is found in about 70% of all foods including food colourings. Though food colourings, E-numbers and other food additives should be out of your GAPS patient's diet, cutting out 70% of all foods is rather punishing.

This list can go on. All natural proteins, fats and carbohydrates contain phenolic compounds. If we cut them all out we will have to starve.

However, there is no doubt that autistic children, as well as hyperactive, dyslexic, asthmatic, diabetic, schizophrenic patients and many other GAPS people do react to phenols and many other substances in food. These reactions are very different from the classical allergy and can not be described as allergic because they do not show the changes in the immune system typical of allergy. There is no clear scientific explanation for these reactions found yet Here I would like to propose what I personally believe happens. Many food phenols have strong antioxidant and detoxifying abilities. Any naturopath, homeopath or a doctor, versed in natural medicine, will tell you that before making you feel better any detoxifier initially makes you feel worse. This happens because we all have various toxins stored in the tissues of our bodies. When a detoxifying substance is introduced it washes toxins out of storage sites into the blood stream to be conjugated, taken to elimination organs and excreted in urine, sweat or bile. For those couple of hours, while these toxins are floating in your blood, being dealt with by the body, they cause symptoms. Depending on the nature of the toxin and individual susceptibilities these symptoms can be very different. They can vary from headaches and behaviour abnormalities to skin rashes and sneezing. So, in effect what is happening is that the phenols from the food are trying to "clean you up". This phenomenon is called "detox reaction" or "Herxheimer reaction" and is typically observed in patients doing any detox programme. Stored toxicity does not just sit silenfiy in the tissues of our bodies. It causes symptoms of chronic disease and lays down the ground for cancer formation. So detoxifying is an important thing to do. It has to be an ongoing process throughout our lives. Nature provided us with plenty of opportunity to do that by placing phenols and other powerful detox substances into all our foods.

GAPS children and adults are very toxic. Tests show that they store heavy

metals, petrochemicals and other toxic substances in the tissues of their bodies sometimes in frightening amounts. Many of these toxins are probably responsible for various physical and mental symptoms in GAPS patients. For example, there are great similarities in the clinical picture of acute poisoning with mercury, lead and other toxins, found in these patients, and the clinical picture of autism and psychosis. Based on these findings recently there has been a lot of attention to heavy metal chelation in autism, the purpose of which is to take heavy metals out of the body. Anybody familiar with chelation knows that this process always involves the child going through a detox period, when autistic symptoms get worse and a lot of unpleasant new physical symptoms occur. Why? Because chelation drugs wash out stored heavy metals from the tissues into the blood to be taken out of the body. This "cleaning up" process causes symptoms, often quite severe.

There is no doubt that detoxification or elimination of toxic substances has to be an integral part of the treatment for GAPS patients . Natural phenols found in foods are the Nature's way of eliminating toxins from the body on a daily basis. So, the last thing we should do is to cut them out of the diet. Of course, in the process of "cleaning up" they will cause the "detox reaction". Most phenols in the foods will not cause a severe reaction (unless the patient has a true allergy to a particular food). The child or adult may experience worsening of behaviour and sleep, more self-stimulation, more hyperactivity and mood swings. This period is temporary and most patients survive it very well. As the body starts to detoxify, the negative reaction usually goes away. If your GAPS child or adult is particularly sensitive to some food, cut it out of the diet for 4-6 weeks and then introduce it slowly starting from tiny amounts and gradually increasing them. This way you can keep the detox reaction under control. The important thing is to make sure that the person has not got a true allergy to that particular food, which can be tested for in most medical facilities.

Clinical experience shows that when the patient has been put on the appropriate diet for GAPS, his/her sensitivity to phenols changes: foods, which the patient used to react to do not cause any reaction any more. The diet, which we will be talking about later, has an ability to heal the gut lining, so the toxins and maldigested foods, which used to leak through, do not leak any more. So, the mixture of toxins, which the body has to deal with, gets greatly reduced. And with it change the reactions to detoxifying phenols. Generally, as the gut heals, the reactions to many phenolic com-

pounds as well as many food intolerances go away. As you "fix the leak" there will be less "cleaning up" going on in the body and hence less symptoms, associated with it.

In the meantime there is an amazingly effective way to deal with sensitivity to phenols and other food compounds. It will also deal with true allergies to foods. This way is Neutralisation, The method of neutralisation was first discovered in 1979 by Dr Robert Gardner from Brigham Young University. He found that just a few drops of small water dilutions of pure phenolic compounds would completely neutralise allergic reactions to foods. There is no explanation found yet for how this method works, but there is data to show that it can work remarkably well. In every individual case a particular neutralising dose has to be found, which then will be given to the patient as drops under the tongue. Today neutralisation has become a well-established method of treating allergies and food sensitivities and in most developed countries there are allergy specialists who can do it. Neutralisation may allow your GAPS child or adult to have the foods, he or she used to react badly to, without any limitations.

In conclusion, there is no need to deprive children and adults with autism, ADHD, schizophrenia, dyslexia, dyspraxia, etc. of fruit, vegetables, nuts and many other phenol containing foods. They are full of nourishment and will help your GAPS patient to detoxify quicker in order to achieve his or her full potential.

"We had bad experiences with phenols. Tom used to get red ears, would become irritable, basically "off the wall" When we started the diet (she means the correct diet for GAPS) we tried the phenol foods again. Now we have no phenol problems. Hooray!"
Tom's mother,

Correspondence via e-mail

The Anti-Candida Diet

As we discussed before the era of antibiotics and steroids gave yeasts and moulds a special opportunity. These ubiquitous micro-organisms always lived in our bodies. However, in a healthy body they are controlled by the beneficial bacteria and do us no harm. As these good bacteria get destroyed by antibiotics and other modern influences, yeasts get out of control and turn from a harmless neighbour into a terrible menace. One particular family of yeasts called *Candidahas* received the most attention.

It is a large family of fungi which cause a commonly known problem, called "thrush" When that happens *Candida* transforms from its harmless one cell state into an invasive active state, when it grows long stringy hyphae and puts "roots" through the tissues of the body This sort of growth can happen in the digestive system and many other internal organs producing a whole host of toxic substances, alcohol and acetaldehyde being some of them. Pretty much every chronic degenerative disorder has been connected to Candida overgrowth from arthritis and digestive problems to ME, MS, Chronic Fatigue Syndrome, Fibromialgia and neurological disorders. GAPS children and adults almost without exception are seriously affected by *Candida* species and possibly other fungi.

As *Candidaand* other yeasts thrive on sugars, the anti-candida diet aims to remove all food sources for these pathogens: sugar and everything, that contains it, fructose, maltose, lactose and other sugars, including maple syrup and honey. Fruit is excluded as it is viewed as a source of simple sugars. As *Candida* overgrowth can cause an allergy to other fungi and moulds, all fungi and fermented foods are also eliminated: yeast and baked foods made with yeast (breads, pastries, etc.), soured milk products, all cheeses, all fermented beverages, vinegar, malt, mushrooms, tea and coffee, dried fruit and fruit juices. However, grains are not excluded from the diet: corn, barley, wheat, rye, millet, oats, rice, etc. and foods, made out of them, as long as they do not contain yeast. Starchy vegetables are not excluded either: potato, yams, sweet potato and Jerusalem artichoke.... And this is where the problem is. Let us see, why?

Candida is never alone in the digestive system. It lives in company with some other 500 or more different microbes which can cause disease. And indeed, when the gut flora of a GAPS patient is tested apart from *Candida* there are many other pathogens detected, *Clostridia* family being the most common one. These pathogens and their toxins damage the gut lining, making the enterocytes (major digesting and absorbing cells of the gut) unable to perform their duties of splitting up carbohydrates into small enough molecules to be absorbed. The result is that complex carbohydrates, those found in grains and starchy vegetables, do not get digested and become food for the pathogenic flora. They undergo fermentation and putrefaction in the gut, instead of proper digestion, and become a source of toxins, which would further damage the gut wall and undermine the immune system. The majority of pathogens, including different bacteria, fungi, protozoa and worms feed on undigested carbohydrates.

The anti-**Candida** diet in combination with GFCF diet and often with

phenol free diet is promoted for autistic children. In practise what it boils down to is lots of rice and things made out of it, potato, potato crisps, gluten free breads, biscuits and other baked goods, as autistic children crave processed carbohydrates. Unfortunately these carbohydrates will allow their inflamed and damaged gut to stay inflamed and damaged, keeping up the toxicity in the body. That very toxicity which makes these children autistic.

So, what exactly should GAPS people avoid in their diet?

To understand that we need to look at how foods are absorbed in our human digestive tract The absorption of digested foods happens in the small intestine, mainly in its first two parts: the duodenum and jejunum. The walls of these parts of digestive system form tiny finger-like protrusions, called villi, to increase the absorptive surface. These villi are lined by the cells, called enterocytes. These are the cells, which absorb our food and pass it into the blood stream to nourish our bodies (FIG. 3).

The importance of these cells in our health simply can not be overestimated. These cells are born at the base of the villi and through the course of their short life travel to the top of the villi, slowly getting more mature on the way. When they reach the top of the villi they get shed off, because by then they have performed so much work that they become old and worn out. This process of constant renewal of enterocytes is ruled by the beneficial bacteria, which live on them. As already mentioned in the chapter on gut flora, the beneficial bacteria ensure that enterocytes are healthy and capable of performing their jobs. When the beneficial bacteria are not there and instead of them the absorptive surface of the intestine is populated by pathogenic microbes, the enterocytes can not be healthy and can not perform their duties. The animal research shows that in the absence of good bacteria enterocytes change their shape, their travel time to the top of the villi becomes too long which can turn them cancerous. But most importantly they become unable to perform their jobs of digestion and absorption of food. Let us have a look how enterocytes absorb different groups of nutrients: carbohydrates, proteins and fats.

Carbohydrates

All carbohydrates are made of tiny molecules, called *monosaccharides.* There are many of them. The most common ones are glucose, fructose and

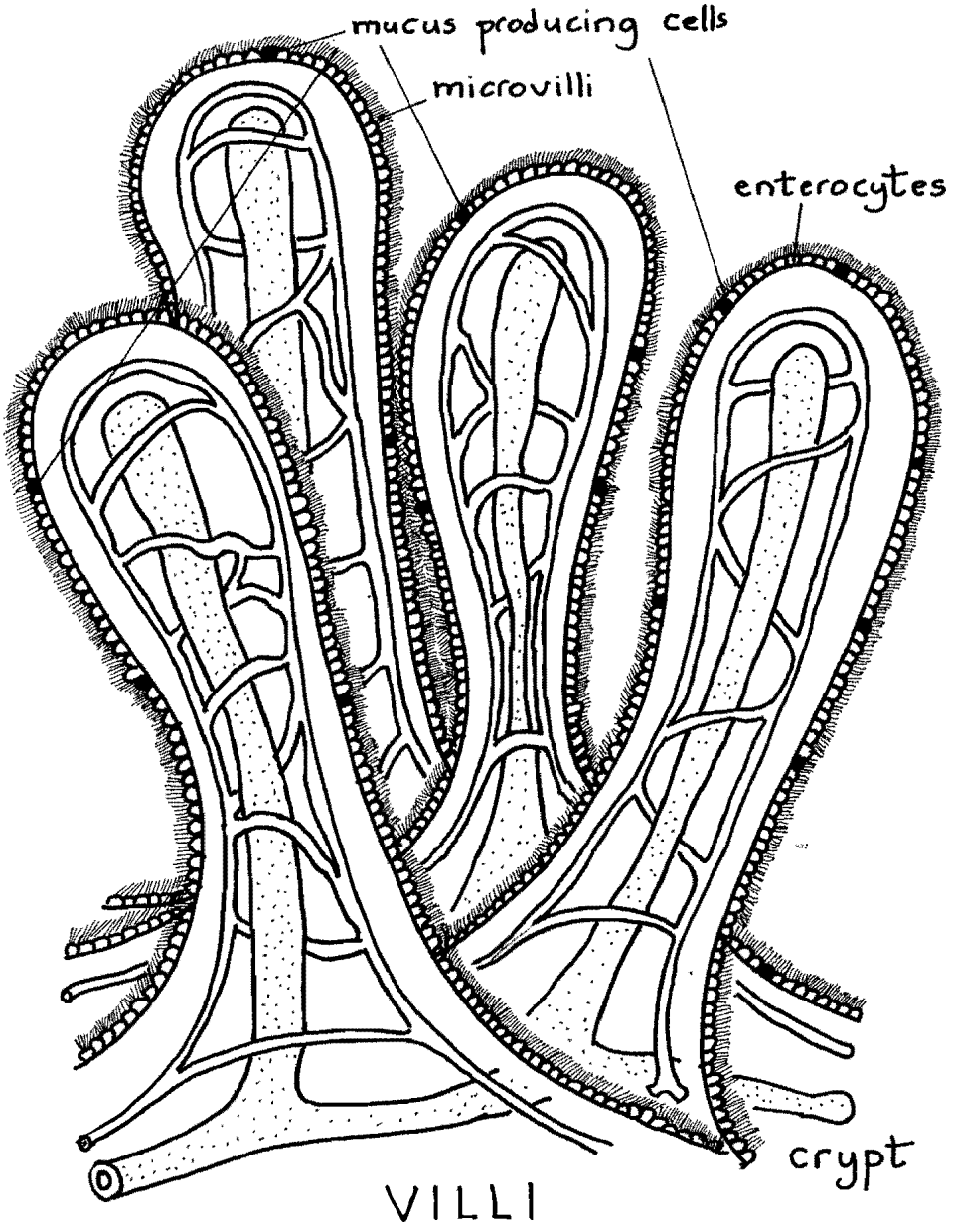

FIG. 3 The absorptive surface of intestines.

galactose. These *monosaccharides* or *monosugars* can easily penetrate the gut lining, they do not need digestion. Glucose and fructose are found in abundance in fruit and vegetables. Honey is made of fructose and glucose and does not require much digestion. Galactose is found in soured milk products, like yoghurt. *Monosugars* from fruit and some vegetables are the easiest carbohydrates for us to digest and should be the main form of carbohydrate in the diet of any person with a digestive disorder.

The next size carbohydrates are *disaccharides* or *double sugars,* made out of two molecules of monosaccharides. The most common ones are sucrose (the common table sugar), lactose (the milk sugar) and maltose from digestion of starch. These *double sugars* can not be absorbed without quite a bit of work on the part of enterocytes. The tiny hairs (microvilli) on the surface of enterocytes, called the brush border, produce enzymes *disaccharidases* which break down the double sugars into monosaccharides to be absorbed. This is where the biggest problem lies for people with digestive disorders. The sick enterocytes loose their ability to produce brush border enzymes. As a result double sugars, like sucrose, milk sugar lactose and products of starch digestion can not be split into monosugars and hence can not be absorbed. They stay in the gut becoming major food for pathogenic bacteria, viruses, *Candida* and other fungi, getting converted into a river of toxic substances which damage the gut wall even further and poison the whole body. Deficiencies in disaccharidases almost always accompany all sorts of digestive disorders. Recent studies performed by Dr K. Horvath in Maryland University and Dr T. Biiie in Harvard confirmed these deficiencies in autistic children. So double sugars or disaccharides have to be out of the diet for GAPS children and adults in order not to feed abnormal flora and to allow the villi time to recover by shedding off sick enterocytes and building a layer of healthy ones.

We have mentioned maltose - the result of starch digestion. Apart from sugar (sucrose) starch is the main form of carbohydrates we consume. All grains and some root vegetables (potato, yams, sweet potato, Jerusalem artichoke, cassava) are very rich in starch. Starch is made of huge molecules with hundreds of monosugars connected into long strands with many branches. Digestion of starch requires quite a bit of work on the part of the digestive system and apparently even in healthy people, due to its complex structure, a lot of starch goes undigested. Undigested starch provides a perfect food for pathogenic flora in the gut, allowing it to thrive and produce its toxins.

Whatever starch does get digested, the result of this digestion are

molecules of *maltose.* Maltose is a double sugar which can not be absorbed without being split up into monosugars by the enterocytes. In a person with abnormal gut flora enterocytes are not able to split double sugars, so maltose goes undigested, unabsorbed and falls prey to the abnormal microbes. To allow the enterocytes to recover and to stop feeding abnormal gut flora, starch has to be out of the diet for GAPS children and adults. It means no grains and anything made out of them and no starchy vegetables. Clinical practice shows that when the gut has been given a long enough period without double sugars and starch, it has a good chance to recover. Once this recovery takes place, the person can start having grains and starchy vegetables again without any ill effects.

Of course, nothing in Nature is black and white. Most fruit, particularly unripe, contain some sucrose, which is a double sugar. That is why it is very important to eat ripe fruit. Most vegetables and some fruit contain a little bit of starch. However, the amounts of sucrose and starch in fruit and non-starch vegetables are tiny compared to grains, starchy vegetables and table sugar. In the majority of people with digestive disorders their gut lining can cope with these tiny amounts of sugar and starch from fruit and non-starch vegetables.

Proteins

As a result of digestion in the stomach by an enzyme called Pepsin and in the duodenum by pancreatic protein digesting enzymes, proteins arrive to enterocytes in the form of peptides. Peptides are small chains of protein, made of amino acids and normally should not be absorbed until they are broken down into single amino acids. This process is accomplished by enterocytes. On their hairy surface (the brush border) healthy enterocytes have peptide digesting enzymes, called Peptidases. Each peptidase is specific for a certain peptide chain and even for a certain chemical bond in this chain. These enzymes brake the peptides down into single amino acids, which then get absorbed. In a child or adult with abnormal gut flora enterocytes are sick. They are unable to produce many different peptidases and to accomplish this last step in protein break down and absorption of amino acids. At the same time the pathogenic bacteria, fungi and viruses damage the gut wall, allowing undigested peptides to leak through. We already know two proteins which do not get broken down properly and get absorbed as peptides: gluten from grains and casein from milk. There may be more proteins, which we have not studied yet and which may not be

digested properly and absorbed as peptides. Hopefully, future science will show.

In the meantime, proteins are essential for us to have, particularly for a growing child. The best sources of easy to digest and very nourishing proteins are eggs, meats and fish. For GAPS children and adults it is important to have easily digestible proteins to make the work as easy as possible for their digestive systems. The way we cook meats and fish has an effect on their digestibility: boiled, stewed and poached meats and fish are much easier to digest, than fried, roasted or grilled. Eggs are one of the nature's treasure chests of excellent quality protein, most B vitamins, zinc and many other useful nutrients. Unless the patient shows a clear allergy to egg, eggs should be an important part of the diet.

Fats

To be absorbed fats require bile. The enterocytes do not have to do much work in absorbing fats, as far as we know. That is why the clinical practice shows that people with digestive disorders tolerate fats quite well. However, there is a problem in a person with abnormal gut flora. The gut lining is a mucous membrane. Any mucous membrane, when under attack from pathogens to protect itself produces a lot of mucous. In people with digestive disorders mucous production is excessive. These large amounts of mucous interfere with digestion of food including fats. Mucous coats food particles and does not allow bile and digestive etizymes to get to them. As a result a lot of fat goes undigested and often comes out as pale greasy stools. This impaired absorption of fats also causes deficiencies in fat soluble vitamins: A, D, E and K. Clinical experience shows that when the starch and double sugars are out of the diet for long enough period, the production of mucous normalises and as a result the absorption of fats improves.

To summarise:

A GAPS patient has to avoid:

- All grains and anything made out of them: wheat, rye, rice, oats, corn, maize, sorghum, barley, buckwheat, millet, spelt, triticale, bulgur, tapioca, quinoa, cous-cous (some of them are not stricfiy grains, but are commonly perceived as such, so we listed them here together with

the grains). This will remove a lot of starch and all gluten from the diet. In fact removal of all grains makes the diet truly gluten free.

- All starchy vegetables and anything made out of them: potato, yams, sweet potato, parsnip, swede, lerusalem artichoke, cassava, arrowroot and taro.
- Sugar and anything that contains it.
- Starchy beans and peas: soybeans, mungbeans, garbanzo beans, bean sprouts, chickpeas, fababeans.
- Lactose and anything that contains it: fluid or dried milk of any type, commercially produced yoghurt, buttermilk and sour cream, processed foods with added lactose.

For a full list of foods to avoid look in the next chapter.

No processed foods, please!

"Do you know what breakfast cereal is made of?
It's made of all those little curly wooden shavings
you find in pencil sharpeners!"

Roald Dahl,i964,
[Charlie and the Chocolate Factory)

We live in an era of convenience foods, which are very processed foods. When Mother Nature made us, humans, she at the same time provided us with every food we need to stay healthy, active and full of energy. However, we have to eat these foods in the form Nature made them. It is when we start tampering with the natural foods we start getting into trouble. Any processing that we subject the food to, changes its chemical and biological structure. Our bodies were not designed to have these changed foods! The more food is processed, the more nutrient depleted and chemically altered it becomes. Apart from losing its nutritional value, processed food loses most of its other properties: taste, flavour and colour. So, to compensate for that various chemicals are added: flavour enhancers, colours, various E - numbers, additives and preservatives. Many of these chemicals have been conclusively shown to contribute to hyperactivity, learning disabilities, psychiatric disorders and other health problems. Natural foods do not keep very well, so the industry has to change them to prolong their shelf-life. So, natural foods get subjected to extreme heat, pressure, enzymes, solvents and countless number of various other chemicals, fats get

hydrogenated and proteins get denatured. Natural foods get changed into various chemical concoctions, which are then packaged nicely and presented to us as "food". "Food" made to suit commercial purposes where health considerations never enter the calculation. The manufacturers are obliged to list all the ingredients on the label. However, if the manufacturer uses an ingredient, which has already been processed or made from processed substances, this manufacturer is not obliged to list what that ingredient was made from. So, if you are trying to avoid something in particular, like sugar or gluten for example, reading an ingredient list may not always help you.

If we look at the supermarket shelves, we will see that the bulk of processed foods are carbohydrates. All those breakfast cereals, crisps, biscuits, crackers, breads, pastries, pastas, chocolates, sweets, jams, condiments, sugar, preserved fruit and vegetables, frozen pre-cooked meals with starches and batter are highly processed carbohydrates. We will examine some of them in detail. But first, let's look at them as a group.

All carbohydrates in foods get digested and absorbed as glucose. Nature provided us with plenty of carbohydrates in the form of fruit, vegetables and grains. When we eat them in the natural untampered form, the carbohydrate part of them gets absorbed slowly, producing a gradual increase in blood glucose, which our bodies are designed to handle. Processed carbohydrates get absorbed very quickly, producing an unnaturally rapid increase in blood glucose. Blood glucose is one of those factors which our bodies go to great lengths to keep within certain limits, because both high and low values are harmful. A rapid increase in blood glucose, called **hyperglycaemia,** puts the body into a state of shock prompting it to pump out lots of insulin very quickly to deal with the excessive glucose. As a result of this overproduction of insulin, about an hour later the person has got a very low level of blood glucose, called **hypoglycaemia.** Did any of you notice that after eating a sugary breakfast cereal in the morning you feel hungry again in an hour. That is hypoglycaemia. What do people usually have at that time in the morning to satisfy their hunger? A biscuit, a chocolate bar, a coffee or something like that, and the whole cycle of hyper - hypoglycaemia begins again. This up and down blood-glucose roller-coaster is extremely harmful for anyone, let alone our GAPS children and adults. It has been proven that a lot of hyperactivity, inability to concentrate and learn, aggression and other behavioural abnormalities in school children are a direct result of this glucose roller coaster. The hyperglycaemic phase produces a feeling of a "high" with hyperactive and manic

tendencies and self-stimulation in autistic children, whilst the hypoglycaemic phase makes them feel unwell, often with a headache, bad mood, tantrums, aggression and general fatigue with excessive sweating (FIG. 4}.

Another important point about processed carbohydrates is their detrimental effect on the gut flora. We have talked in detail about the crucial role of the normal gut flora in the health. Processed carbohydrates feed pathogenic bacteria and fungi in the gut, promoting their growth and proliferation. Apart from that they make a wonderful glue-like environment in the gut for various worms and parasites to take hold and develop. All these micro-creatures produce toxic substances going into the bloodstream and literally "poisoning" the person. The more processed carbohydrates with or without gluten you give your GAPS child or adult, the more "toxic" he or she will become and the more autistic, schizophrenic, hyperactive or other symptoms you will see.

In the previous chapters we have looked in detail at the state of the immune system in GAPS patients. Compromised immunity plays an important role in GAPS development. By negatively altering the gut flora processed carbohydrates will play an important part in damaging the person's immune system. However, on top of that there is ample evidence showing that processed foods, particularly processed carbohydrates and sugar, directly weaken the functioning of macrophages, natural killer cells and other white blood cells and undermine systemic resistance to all infections. An immune-compromised person who has sugary drinks and crisps daily, will worsen their immune system's condition by these food choices.

Let us have a look at some of the most common forms of those processed carbohydrates.

Breakfast cereals

They are supposed to be healthy, aren't they? That is what numerous TV advertisements tell us. Unfortunately, the truth is just the opposite.

- Breakfast cereals are highly processed carbohydrates, full of sugar, salt and other unhealthy substances. A bowl of breakfast cereal will start your child's day with the first round of the blood-sugar roller coaster with the all too familiar behaviours for you to deal with.
- Being a great source of processed carbohydrates, breakfast cereals feed abnormal bacteria and fungi in the gut, allowing them to produce a new portion of their toxins perpetuating the vicious cycle of GAPS.

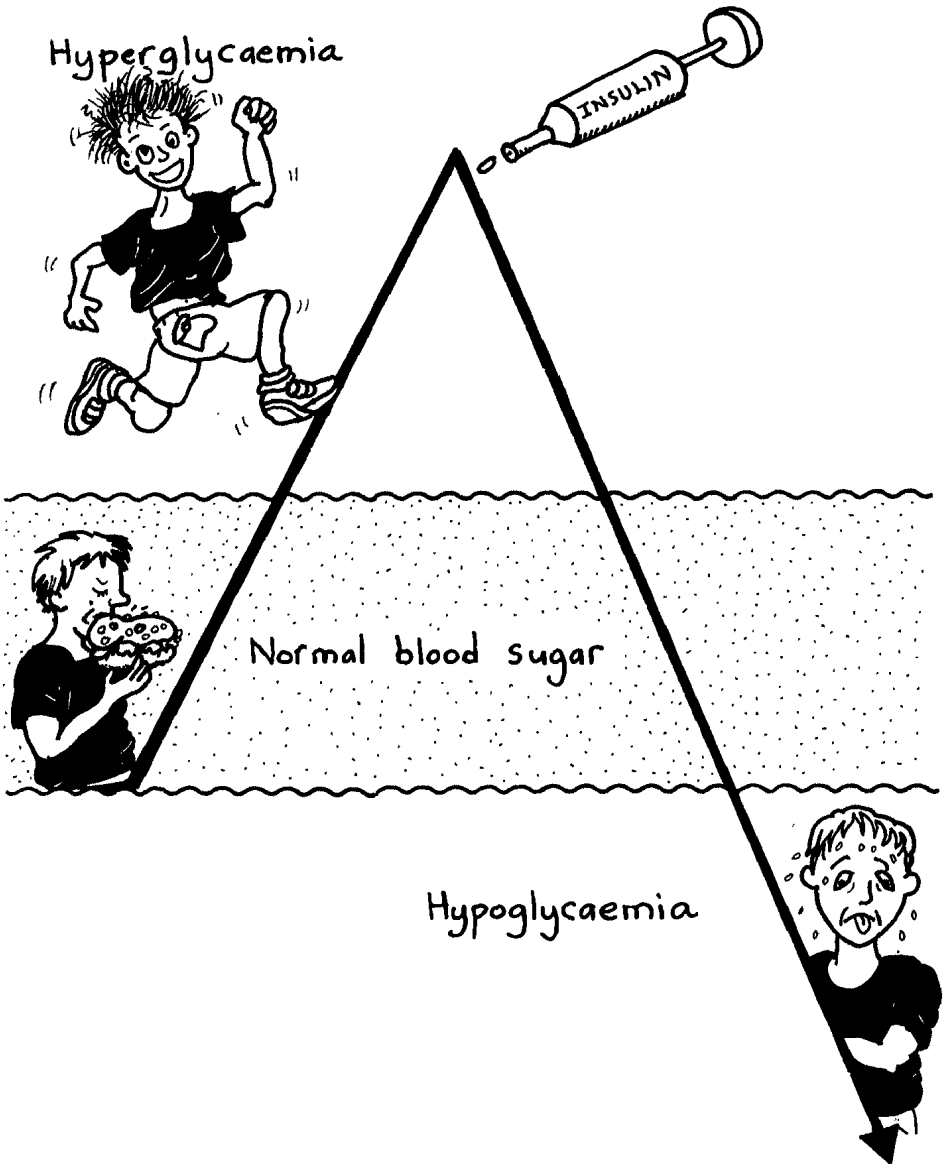

FIG. 4 Blood-glucose roller coaster.

- What about fibre? The manufacturers claim that with a bowl of their product you will get all the fibre you need. Unfortunately it is the wrong kind of fibre for GAPS patients. The fibre in breakfast cereals is full of phytates - substances that bind essential minerals and take them out of the system, contributing to a patient's mineral deficiencies.
- There has been an interesting experiment performed in one of the food laboratories. They analysed the nutritional value of some brands of breakfast cereals and the paper boxes in which these cereals were packaged. The analysis showed that the box, made of wood pulp, had more useful nutrients in it, than the cereal inside. Indeed, breakfast cereals have got very low nutritional value. To compensate for that the manufacturers fortify them with synthetic forms of vitamins, claiming that by eating your morning bowl of this cereal you will get all your daily requirements of those vitamins. Well, the human body is not that simple, it has been designed to recognise and use natural vitamins, coming in natural food form. That is why synthetic vitamins have a very low absorption rate, which means that most of them go through and out of your digestive tract without doing you any good. Then, whatever amount of those vitamins does get absorbed is often not recognised by the body as food and gets taken straight to the kidneys and excreted in urine. We have a new syndrome in our modern pill-popping society - a syndrome of expensive urine.

So, no matter what the advertisements say, there is nothing healthy in breakfast cereals for the GAPS child or an adult.

Crisps and chips and other starchy snacks

Crisps, chips and popcorn, a backbone of children's diet nowadays, are highly processed carbohydrates with a detrimental effect on the gut flora. But that is not all: they are saturated with vegetable oil, which has been heated to a very high temperature. Any oil that has been heated has got substances called trans-fatty acids, which are unsaturated fatty acids with altered chemical structure. What they do in the body is to replace the vital omega-3 and omega-6 fatty acids in cellular structure, making the cells dysfunctional. Consuming trans-fatty acids has a direct damaging effect on the immune system. They are known to increase the activity of Th2 and weaken Thi immunity. As you remember, the Thi immunity is already sup-

pressed in many GAPS patients and Th2 overactive. Cancer, heart disease, eczema, asthma, many neurological and psychiatric conditions have been linked to trans-fatty acids in the diet. For a full story about fat processing please look in the chapter: *Fats: the good and the bad.*

Recently another strong argument appeared against consuming crisps and chips:

TheAcrylamides story

In the spring of 2002 the Swedish National Food Administration and Stockholm University reported that they found highly neurotoxic and carcinogenic substances in potato crisps, French fries, bread and other baked and fried starchy foods. These substances are acrylamides. Scientists in Norway, UK and Switzerland have confirmed this finding. They have also found acrylamides in starchy foods, fried or baked at high temperatures. Recently, instant coffee has been added to the list of foods containing these highly dangerous substances. The World Health Organisation, United Nations Food and Agriculture Organisation and the US Food and Drug Administration have set a plan to identify how acrylamides are formed in foods and what can be done to eliminate them, since they can cause cancer, neurological damage and infertility. Acrylamides are so harmful to health, that there are certain maximum limits set for these substances in food packaging materials. For years government agencies paid a lot of attention to controlling the amount of acrylamides in the plastic food packaging, but nobody looked at the food inside that packaging. Now it has been discovered that some foods inside these plastic packets have incredibly high amounts of acrylamides, way above all allowed limits. The acrylamides story provides another reason for the GAPS child or adult to avoid crisps, chips and other starchy snack foods.

Wheat

Cutting out gluten is recommended for autism, schizophrenia and coeliac disease, so gluten-free wheat products become a major part of their diet. But let us have a look at wheat as a whole with gluten or without it. Virtually nobody buys wheat as a grain and cooks it at home, we buy foods made of wheat flour. The flour arrives at bakeries in pre-packaged mixes for different kinds of breads, biscuits and pastries. These mixtures are already processed with the best nutrients lost. Then they are "enriched" with preserva-

tives, pesticides to keep the insects away, chemical substances to prevent it absorbing moisture, colour and flavour improvers, softeners, just to mention a few. Then the bakerymakes breads, pastries, cakes, biscuits, etc., out of these chemical cocktails for us to eat. The producer is quite happy to take the gluten out of these mixtures and make gluten-free products. So, you will get all the processed carbohydrate with all the chemical additives in it, but this time without gluten. Once swallowed, a piece of white bread turns into a glue-like mass, which feeds parasites and pathogenic bacteria and fungi in the gut, contributing to the general toxic overload a GAPS patient already has got Being a staple in the western world, wheat is also a number one cause of food allergies and intolerances.

Sugar and anything made with it

Sugar was once called a "white death" It deserves 100% of this tide. The consumption of sugar in the world has grown to enormous proportions in the last century It is estimated that an average western person consumes about 160-200 lb. of this highly processed substance per year. Sugar is everywhere and it is hard to find any processed food without it Apart from causing the blood-glucose roller coaster and having a detrimental effect on the gut flora, it has been shown to have a direct damaging effect on the immune system, which is already compromised in GAPS patients. On top of that, to deal with the sugar onslaught, the body has to use available minerals, vitamins and enzymes at an alarming rate, finishing up being depleted of these vital substances. For example, to metabolise only one molecule of sugar the body requires around 56 molecules of magnesium. Consumption of sugar is a major reason for widespread magnesium deficiency in our modern society leading to high blood pressure, neurological, immune and many other problems. A GAPS patient is already deficient in magnesium and many other vital nutrients and should not have sugar in any form. Cakes, sweets, and other confectioneries are made with sugar and wheat, as the main ingredients, plus lots of chemicals like colours, preservatives, flavourings, etc. It goes without saying that they should be out of the diet (with or without gluten).

Soft drinks are a major source of sugar in our modern diets, not to mention all the chemical additives. A can of soda can contain from 5 to 10 teaspoons of sugar. Fruit juices are full of processed fruit sugars and moulds. Unless freshly pressed, they should not be in your diet either. Aspartame, a sugar replacement in so-called "diet" drinks, has been found to be

carcinogenic and neurotoxic and most definitely should be avoided by GAPS children and adults.

Sugar and wheat are so insidious that it can be very hard to find any processed food on the supermarket shelves without sugar and wheat.

To summarise, any GAPS patient, be it autistic, schizophrenic, hyperactive, dyslexic, asthmatic, etc., should have no processed foods at all in his/her diet. All foods should be bought fresh, as close to the way Nature made them as possible, and prepared at home. A digestive tract is a long tube. What you fill that tube with has a direct effect on its well being. A GAPS digestive system is damaged and very sensitive. You cannot trust any food manufacturer to fill it in. You have to fill your GAPS child's (or GAPS adult's in your care) digestive system yourself by freshly cooked nourishing food, where you are in control and in charge of what the exact ingredients are and how they are processed.

No Soya, please!

Soya is a very big business, particularly in the USA. A large percent of the industry uses genetically modified soya. Soya is cheap to produce and following some research showing that it can be beneficial for menopausal women, the whole market has exploded with soya products. It can be found in many processed foods, margarines, salad dressings and sauces, breads, biscuits, pizza, baby food, children's snacks, sweets, cakes, vegetarian products, dairy replacements, infant milk formulas, etc. Is there a problem with that? Let us have a look at some facts.

1. The benefits to menopausal women, seen in Japan and other eastern cultures are due to the form in which soy is traditionally used: as a whole bean or fermented as a soy sauce, tofu, miso and tempeh. The form in which soya is used in the west is called soy protein isolate. How is it made? After removing the fibre with an alkaline solution the soybeans are put into large aluminium tanks with an acid wash. Acid makes the soybeans to absorb aluminium, which will remain in the end product. Aluminium has been linked to dementia and Alzheimer's disease and indeed there has been a lot of publicity recently linking soy consumption with these mental disorders. After the aluminium-acid wash the beans are treated with many other chemicals including nitrates, which have been implicated in cancer development. The end product is an almost tasteless powder, easy to use and add to any food.

Up to 60% of processed foods including soya milk and soya infant formulas contain this powder.

2. Soya is a natural goitrogen. What does it mean? It means that soya has an ability to impair iodine absorption and reduce thyroid function. Due to various toxins found in GAPS patients they are, almost without exception, hypothyroid, which means that their thyroid function is already impaired. Low thyroid function has very serious implications for a growing child, including abnormalities in brain development and maturation. Having soya in the diet will reduce the child's thyroid function even further.
3. Soya beans have a very high concentration of phytates, These are substances, found in all grains as well, particularly in their bran. Phytates have a great ability to bind to minerals and not allow them to be absorbed, particularly calcium, magnesium, iron and zinc. We already know that GAPS children and adults are deficient in these vital minerals. Adding soy to their diet would make these deficiencies even worse.
4. Great Plains Laboratory, which have performed allergy testing on a large number of autistic children, found that almost every child had extremely high allergies to soy. Based on their experience the head of the laboratory Dr W. Shaw directly advises against the use of soy in autistic children.
5. Soy has gained its popularity as a treatment for menopause because it contains natural oestrogens or phytoestogens. These substances may be useful for menopausal women, but not for small children. There is a growing concern among health professionals on the amount of phytoestogens infants and small children might be getting from soya milk and infant formulas. Again, due to toxicity in their bodies the whole hormonal balance is already upset in GAPS children. Adding another interference in the form of phytoestogens does not seem like a good idea.

What about soy in the natural traditional form as a soy sauce, tofu, tempeh, etc.? It is very common among people with *Candida* overgrowth to be allergic to fermented foods. Traditional soy products are fermented. So, whichever way you look at soya it is best to be avoided by GAPS patients.

A letter from a parent (23 November 2003)

Walker was 3½ years old [when he] was diagnosed with moderate-severe autism and dyspraxia. He was non-verbal and the specialists were telling us that he may never speak.

We followed the advice of researchers and put him on a strict gluten/casein (gf/cf) free diet. We did have success with this, but felt there was more that could be done. It wasn't until I consulted with you about a nutritional plan for Walker that I realised we had a long way to go in terms of eating healthy and healing Walker's gut! The ironic thing was that we always considered ourfamily as being relatively health-conscious. Upon analysing our diet, I quickly realised that we had fallen into the trap of eating nothing but processed, chemically-treated, convenience food. We began to follow your advice by eating foods in their natural, raw state and saw almost immediate changes in Walker. Within a few weeks, Walker spoke his first sentence and the rest is history!

The nutritional advice you gave us was invaluable to Walker's recovery.

I use the word "recovery" here because as of today, my son (who is now 5 years old) is attending mainstream school and has many friends. In fact, he's a social butterfly! He is learning at a normal rate and his autism and dyspraxia are almost undetectable!! Anyone who knew Walker 2 years ago cannot believe the "transformation" which has taken place. How could a boy who was completely emotionless and cut off from the world be the same boy he is today? It's just amazing.

When I talk to people about "diet and nutrition" today, they don't quite understand how food can affect a person in that way. After all, it is quite difficult for someone who hasn't seen what we've seen to fully comprehend his miracle in its entirety!

Although there are many books written on special diets for children with autism, ADD, ADHD, etc., (and I've read them all) I haven't come across one that is similar to the nutritional advice you suggested for Walker. In fact, I've found many of these books suggesting foods that I know would actually cause Walker great harm. The older research that specifically talks about a strict gf/cf diet is just the tip of the iceberg ... there is much more to this story! I get very frustrated when I see many families following this advice and buying "processed" gf/cf products that contain many other harmful ingredients. These are often the same parents who are elated to discover that Diet Coke and potato crisps are gf/cf and go out and buy them in bulk!! Ugh!

Holly Branch, mother of Walker
Surrey, UK

2. THE APPROPRIATE DIET FOR GAP SYNDROME

We have concentrated on some diet aspects in the previous chapter. Now, let us discuss, what is the right diet for GAPS people.

GAP Syndrome essentially is a digestive disorder and should be treated as such. There is no need to re-invent the wheel when it comes to designing a diet for digestive disorders. There is a diet already invented, a very effective diet with a more than 60-year excellent record of helping people with all sorts of digestive disorders, including such devastating ones as Crohn's disease and ulcerative colitis. This diet is called Specific Carbohydrate Diet or SCD for short.

SCD was invented by a renowned American paediatrician Dr Sidney Valentine Haas in the first half of the 20th century. Those were the good old days, when doctors used to treat their patients with diet and natural methods. Carrying on with the work of his colleagues Drs L. Emmett Holt, Cristian Herter and John Howland, Dr Haas has spent many years researching the effects of diet on celiac disease and other digestive disorders. He and his colleagues found that patients with digestive disorders could tolerate dietary proteins and fats fairly well But complex carbohydrates from grains and starchy vegetables made the problem worse. Sugar, lactose and other double sugars also had to be excluded from the diet. However, certain fruit and vegetables were not only well tolerated by his patients, but improved their physical status. Dr Haas treated over 600 patients with excellent results - after following his dietary regimen for at least a year there was "complete recovery with no relapses, no deaths, no crisis, no pulmonary involvement and no stunting of growth". The results of this research were published in a comprehensive medical textbook *The Management of Celiac Disease,* written by Dr Sidney V Haas and Merrill P. Haas in 1951. The diet, described in the book, was accepted by the medical community all over the world as a cure for celiac disease and Dr Sidney V Haas was honoured for his pioneer work in the field of paediatrics.

Unfortunately, "happy end" does not happen in human history too often. In those days celiac disease was not very clearly defined. A great number of various inflammatory conditions of the gut were included in the

diagnosis of celiac disease and all those conditions were treatable by the SCD very effectively. In the decades that followed something terrible happened. Celiac disease was eventually defined as a gluten intolerance or gluten enteropathy which excluded a great number of various other gut problems from this diagnosis. As the "gluten-free diet" was pronounced to be effective for celiac disease, the SCD diet got forgotten as outdated information. And all those other inflammatory gut conditions, which fell out of the sphere of true celiac disease, got forgotten as well. The true celiac disease is very rare, so the "forgotten" gut conditions would constitute a very large group of patients, which used to be diagnosed as celiac and which do not respond to treatment with the gluten-free diet. Incidentally, a lot of "true" celiac patients do not get better on the gluten-free diet either. All these conditions respond very well to the SCD diet, developed by Dr Haas. GAP Syndrome would fall into this group.

Following the whole controversy about celiac disease, the Specific Carbohydrate Diet would have been completely forgotten if it wasn't for, you guessed it, a parent!

Elaine Gottschall, desperate to help her little daughter, who suffered from severe ulcerative colitis and neurological problems, went to see Dr Haas in 1958. After two years on SCD her daughter was completely free of symptoms, an energetic and thriving little girl. Following the success of the SCD with her daughter Elaine Gottschall over the years has helped thousands of people, suffering from Crohn's disease, ulcerative colitis, celiac disease, diverticulitis and various types of chronic diarrhoea. But the most dramatic and fast recoveries she has reported in young children who, apart from digestive problems, had serious behavioural abnormalities, such as autism, hyperactivity and night terrors. She has devoted years of research into the biochemical and biological basis of the diet and has published a book, called *Breaking the Vicious Cycle, Intestinal Health Through Diet* This book has become a true saviour for thousands of children and adults across the world and has been reprinted many times. A number of web-sites and web-groups have been set up to share SCD recipes and experiences. Dr Gottschall is in her eighties now, still very active and helping many people around the world with the implementation of the Specific Carbohydrate Diet. For the full details on how to implement this diet I would highly recommend Elaine Gottschall's book.

The diet appropriate for GAPS patients is largely based on the Specific Carbohydrate Diet. However, there is one issue that has to be taken into account - the use of dairy products.

What about dairy?

The Specific Carbohydrate Diet permits lactose-free dairy products. Lactose is a milk sugar with a double molecule. It is present in fresh milk and many commercially available dairy products. According to various sources from 25% to 90% of the planet's population cannot digest lactose due to the lack of the lactose digesting enzyme, called lactase. Children and adults with GAPS and people with gut problems most certainly cannot digest it and have to avoid it. Well-fermented milk products, such as yoghurt, soured cream and natural cheeses are largely free of lactose because in the process of fermentation the fermenting bacteria consume lactose as their food.

However, apart from lactose milk contains other substances which GAPS people have to avoid. The most researched substance is the milk protein casein. In the previous chapters we have discussed casomorphins - peptides with an opiate structure, which are found in the urine of autistic, schizophrenic, depressed and other patients. Casomorphins come from misdigestion of milk protein casein. They absorb through the damaged gut lining into the bloodstream of the GAPS person, cross the blood-brain barrier and affect the functions of the brain. And indeed when dairy products get completely removed from the diet of an autistic child or a schizophrenic patient we observe an improvement in the clinical picture, sometimes quite dramatic. There is a debate about what particular form of casein is the problem. The group of proteins called beta-caseins have received most attention. For example, Cade and other researchers have shown that in an unhealthy digestive system they convert into beta-casomorphin-7 which gets taken up by 32 various areas of the brain, many of which are responsible for vision, hearing and communication.

Another problem with dairy is its great ability at creating allergies and intolerances. Real allergy to milk is one of the most common allergies in existence, because dairy products have a wide range of antigens (various immunoglobulins). According to various research papers it is the main reason for infantile colic. Even in breast-fed babies if the mother consumes dairy products the child may develop colic due to sensitivity to dairy antigens being passed through the mother's milk. In many cases when the breast-feeding mother stops consuming dairy foods the colic in her baby goes away.

Whether it is lactose or casein or allergies or a combination of factors, the clinical experience shows that GAPS children and adults should not consume dairy products until their digestive system is well enough to

handle them. The only exception is for the milk fat, which contains virtually no milk proteins or lactose and is generally well tolerated. Pure milk fat is called ghee or clarified butter. It is easy to make at home from butter (look in the recipe section). Unfortunately commercially available ghee often contains preservatives and other additives. To make sure that your ghee is pure it is best to make it at home. Ghee contains a lot of valuable nutrients and is excellent for cooking and baking. Some people with severe dairy allergy can not tolerate even ghee and have to avoid it. However, in my experience the majority of GAPS children and adults have no reaction to ghee and can use it in their diet right from the beginning.

The good news about dairy products is that for many patients they do not have to be out of the diet forever. As the gut lining starts to heal many GAPS patients are able to re-introduce other dairy products.

The first product to add to their diet is butter. Butter is virtually pure milk fat and contains only very small amounts of whey, which at a certain stage in the diet the patients can usually handle. Butter should be bought organic, because non-organic butter contains a lot of pesticides, hormones and antibiotics, which non-organic cows consume. I generally recommend to try introducing butter after 6 months on the diet. It is preferable to have unsalted butter as a lot of salt products which are used to preserve butter contain flow agents and other additives. I would like to emphasise here that butter and ghee contain a lot of valuable nutrition for children and adults and should not be avoided, unless there is a true allergy. Butter and ghee provide various fatty acids with important health giving benefits, vitamins A, D, E, beta-carotene and other nutritious substances in an easy to digest form.

In about a year gradual introduction of protein containing lactose free milk products is possible: yoghurt and cheeses. As the gut flora gets established and the digestive system heals many GAPS patients are able to digest milk protein without absorbing it in an opiate-like form of casomorphin. However, all patients are different Some are ready for this step in a few months, some require much longer. It is critical to proceed very carefully and slowly, introducing milk protein containing foods one at a time and starting from tiny amounts watching for any reaction. Any signs of regression in a child or an adult with GAPS would indicate that he/she is not ready. It may be an increase in self-stimulation and worsening of eye-contact, sleep disturbances and increase in anxiety, mood alterations and hyperactivity, eczema flare-up or worsening in allergies. Every patient would have symptoms typical for him or her. Generally from clinical experience I can say that the younger the patient is the sooner he or she is ready for this step. Adults

on average take longer than children. In some cases dairy proteins have to be avoided indefinitely, particularly in long standing cases of schizophrenia and cases complicated by epilepsy, asthma and eczema.

The first protein containing milk product that can be introduced is home-made yoghurt. Why home-made? Because commercially produced yoghurts are often not completely lactose-free due to short fermentation time. Yoghurt has to be fermented for 24 hours at least to be completely lactose-free. So initially the only yoghurt which the GAPS child or adult can have has to be home-made (look in the recipe section for instructions on how to make yoghurt). Apart from consuming lactose the fermenting bacteria pre-digest milk proteins, making them easier for our digestive systems to handle. That is why fermented milk products in general are much easier for us humans to digest.

There is a question about what is the best milk to use for making yoghurt - cow's or goat's. There are some other rare milk products on the market, like sheep and deer, which are not researched to any degree yet and are not practical to discuss here. Goat's milk is considered to be more digestible by humans as it contains less casein and different types of fats and proteins. However, when it comes to beta-casein, which is supposed to be the problem for autistic and schizophrenic patients, the goat's milk contains more of it compared to cow's milk. Unfortunately, there is not much scientific data on this subject for us to rely on. However, in a clinical setting patients do report that goat's milk is much better tolerated than cow's milk. So, initially I recommend making your yoghurt from goat's milk rather than cow's milk. If it is not possible to find goat's milk in your area try to make yoghurt from cow's milk, as indeed Elaine Gottschall used to treat her child and thousands of other patients very effectively. A very important point here is to use only organic milk, as there is a noticeable difference in the clinical observations of the effects of non-organic and organic yoghurt. People who react to non-organic yoghurt often tolerate an organic one perfectly well, because non-organically reared animals have to consume a whole array of chemicals from antibiotics to pesticides, most of which finish up in the milk.

It is important to introduce home-made yoghurt gradually, starting from one tea spoon a day slowly increasing the daily amount to one or two cups a day. It can be added to home-made soups and stews, served as a desert with fruit and honey or mixed with fruit smoothies and drinks. You can drain it through a cheese cloth to produce cottage cheese. It gives a nice variety to the diet. However, I would repeat that the patient's digestive system has to be ready for it! So, do not rush with this step!

Once the GAPS patient can tolerate home-made yoghurt without any problem natural organic cheese can be tried. It has to be said that cheese is one of the more difficult dairy products to introduce as it provides a very concentrated milk protein. Cheese is also a great breeding ground for yeasts and moulds, which a lot of GAPS people can not tolerate. Some GAPS patients find that they can have home-made yoghurt without any problem but can never have cheese. However, in the majority of cases, providing that their digestive system had a good chance to heal, the GAPS children and adults can enjoy a good variety of natural cheeses, like cheddar, dry curd cheese and others (for a full list look at the end of this chapter). As with yoghurt introduce cheeses one at a time, starting from a very small amount (no more than one mouthful) and watching the patient's reaction.

In a few months after safely introducing cheese many patients find that their digestive system is in a good enough state to handle commercially produced live natural yoghurt (with no additives), soured cream and cr&me fresh. At the end of the second year on the diet, fresh cream can be added to the list.

How to introduce dairy products - the summary

Stepi, Only home-made ghee is allowed. This stage lasts on average six months. If your GAPS patient can not tolerate ghee, you may find that this patient will never tolerate any dairy product. However, it is worth leaving it out for six months and then trying again to introduce it.

Step **2.** Organic butter can be added gradually. Watch for any reactions.

Step 3. Home-made yoghurt can be introduced, starting from one tea spoon a day and gradually increasing the daily amount. If there is any negative reaction, wait for a month then try again. The majority of GAPS patients are ready for this step at the end of the first year on the diet.

Step 4. Try a mouthful of organic cheddar cheese with a meal. Watch for any negative reaction for three to five days, as the reaction may be delayed. If there is no negative reaction, gradually increase the amount. Once the cheddar cheese is well tolerated, try to introduce another natural cheese (for a full list of allowed cheeses look at the end of the chapter). Introduce this step only after home-made yoghurt is well tolerated.

Step **5.** Try some commercially available live natural yoghurt, soured cream and creme fraiche. Do not rush with this step. The majority of GAPS people are ready for this step by the end of two years on the diet.

After two years on the diet a lot of GAPS people find that on an occasional basis they can have any natural dairy product without any apparent problems, including milk, cream and cheeses off the allowed list. However, I recommend limiting these products to only occasional use and staying safe with those milk products which are allowed on the diet.

So, what **is** for dinner?

In the previous chapter we have talked in detail about the kind of carbohydrates or sugars allowed on the diet: mono-sugars. They are found in fruit and non-starch vegetables. All complex carbohydrates, those found in grains and starchy vegetables have to be rigorously excluded from the diet. I cannot over-emphasise how important it is to make sure that not even a speck of anything made from sugar, grains or starchy vegetables sneaks into the menu. This is the point when I usually see the panic on the parent's faces, particularly parents who went through all the pain of implementing the GFCF diet. No rice! No biscuits! No cakes! No pasta! No bread! Even gluten free! No chips! No crisps! No popcorn! No ice-cream! No sweets! But that is all my child would eat! My child is going to starve!

Indeed GAPS children and adults usually limit their diets to processed carbohydrates, which they crave due to their abnormal gut flora. So, the important thing is to find replacements for all those foods, which are compatible with the diet The fact that the GAPS people can not have grains and sugar does not mean that they have to be deprived of breads, cakes, biscuits, crackers, pancakes, waffles and muffins. This diet provides you with excellent and very nourishing recipes, where you will replace wheat flour with ground nuts or nut flour (the same thing) and instead of sugar you will use unprocessed natural honey and dried fruit. In the recipe section you will find a number of different delicious recipes. Elaine GottschalFs book will provide you with many more wonderful recipes, and if you have access to the Internet, you will find even more on: www.scdiet.org

www.breakingtheviciouscycle.com

www.geocities.com

www.pecanbread.com

www.uclbs.org

Far from starving, your child will be receiving a most nourishing diet. Let's just have a look at what our GAPS person is going to eat.

Recommended foods

For a full alphabetic list of recommended foods and foods to avoid please look at the end of this chapter.

Meats and fish

All fresh or frozen meats, game, organ meats, poultry, fish and shellfish.

Meats and fish are an excellent source of nutrition. Contrary to popular belief it is the meats and fish and other animal products that have the highest contents of vitamins, amino acids, nourishing fats, many minerals and other nutrients which we humans need on a daily basis. All this nutrition in meats and fish also comes in the most digestible form for us humans. I find it deceptive to see some vitamin tables in some books on nutrition showing that grains provide all our vitamins. First of all the form in which grains contain these vitamins is difficult for us to digest. Secondly if you compare the amounts of vitamins in meat, fish or other animal products with grains it is the animal products which are at the top of the list. Let us just have a look at some of them.

Vitamin Bi (thiamin): the richest sources are pork, liver, heart and kidneys.

Vitamin **B2** (riboflavin): the richest sources are eggs, meat, milk, poultry and fish.

Vitamin **B3** (niacin): the richest sources are meat and poultry.

Vitamin **B5** (pantothenic acid): the richest sources are meats and liver.

Vitamin **B6** (pyridoxine): the richest sources are meat, poultry, fish and eggs.

Vitamin **B12** (cyanocobalamin): the richest sources are meat, poultry, fish, eggs and milk.

Biotin: the richest sources are liver and egg yolks.

Vitamin A: the richest sources are liver, fish, egg yolks and butter.

Vitamin D: the richest sources are fish liver oils, eggs and fish.

The three well-researched vitamins which meats and fish do not have are vitamin C, folic acid and vitamin K. These three have to come from vegetables and fruit. Fruit, apart from avocado, generally interferes with the digestion of meats and should be eaten between meals. Vegetables however combine with meats and fish very well and would provide the missing nutrients. There is another important reason for eating meats and fish with vegetables, which is the way we metabolise food. After digesting and

utilising meats and fish our body tissues accumulate acids. After digesting most vegetables our body becomes alkaline. By combining the meats and vegetables in one meal we balance the acidity in the body, which is important because both too acid and too alkaline states are not very healthy. Raw vegetables have stronger alkalising ability than cooked. However, make sure that your patient's digestive system is ready for raw vegetables before introducing them.

The majority of GAPS patients are anaemic. It is essential for people with anaemia to have red meats on a regular basis (lamb, beef, game and organ meats in particular) because these foods are the best remedy for anaemia. They not only provide iron in the haem-form: the form which the human bodies absorbs best, they also provide the B vitamins and other nutrients essential for treating anaemia. Meats also promote better absorption of non-haem iron from vegetables and fruit while vitamin C from vegetables and greens promote absorption of iron from meat. Large epidemiological studies show that eating red meat is associated with much lower incidence of iron deficiency in different countries of the world.

An absolute resuscitation for an anaemic person is eating liver. Liver is a true powerhouse of nutrition. Whichever nutrient you take, you will find it in abundance in liver, including all the nutrients which GAPS people are deficient in. Making sure that your GAPS patient eats some liver on a regular basis will do immeasurably more for his or her nutritional status than the best and the most expensive supplements in the world. An anaemic person should eat liver and other organ meats once a week at least. A child needs a small amount: one to two tablespoons of cooked ground liver every other day, which can be mixed with any meat dish or a full liver meal once a week. For some ideas on how to cook liver look in the recipe section.

Make sure that you buy meats and fish fresh or frozen, but not preserved, as preserved meats and fish will have a lot of additives (E-numbers, preservatives, starches, sugar, too much salt, lactose and other ingredients) which will not allow the digestive system heal. Hams, bacon, delicatessen meats and all commercially available sausages are preserved meats and should be avoided. Sausages are a popular food, which children in particular like. I recommend finding a local butcher, who makes his own sausages and ask him to produce pure meat sausages for you. The only ingredients in these sausages should be full fat mincemeat, salt and pepper. If you wish to add some fresh garlic, onion or fresh herbs to the mince, that is fine. It is important to specifically emphasise that no commercial seasoning or sausage mix should be added. Most commercial seasonings for sausages

contain a flavour enhancer MSG (mono-sodium glutamate) which GAPS people must not consume.

Meat and fish stock is a wonderful nutritional and digestive remedy. As you cook meats and fish in water a lot of nutrients from the meats get extracted into the water. Use these meat stocks for making soups, stews and simply as a warming therapeutic drink with and between meals. In the recipe section you will find detailed instructions on how to make meat and fish stocks. It goes without saying that all commercially available stock granules and cubes are to be avoided. They do not possess any of the healing properties of a home-made meat stock and are full of detrimental ingredients. Meats cooked in water are easier to digest for a person with a sensitive digestive system.

Eggs are one the most nourishing and easy to digest foods on this planet. Raw egg yolk has been compared with human breast milk as it absorbs almost 100% without needing digestion. Egg yolks will provide you with most essential amino acids, many vitamins (Bi, B2, B6, B12, A, D, biotin), essential fatty acids, a lot of zinc, magnesium and many other nutrients, which GAPS children and adults are deficient in. Eggs are particularly rich in Vitamin B12 vital for normal development of the nervous system and immunity. The large majority of GAPS patients are deficient in B12 and hence anaemic.

Egg yolks are very rich in cholin - an amino acid essential for the nervous system and the liver to function. Cholin is a building block of a neurotransmitter called acethylcholin, which the brain uses for cognitive or learning processes and memory amongst its many functions. Cholin supplementation is recommended for people with neurological damage, memory loss and poor learning ability. Cholin is also prescribed to people with liver problems. GAPS patients almost invariably have cognitive problems and an over-stressed liver and benefit from extra cholin in their diet. Egg yolks, particularly uncooked, would provide the best food source of cholin.

It is sad that based on some faulty "science" and commercial publicity eggs have been made unpopular despite their wonderful nutritional value. This happened because eggs contain cholesterol. In the last decade there has been a number of clinical studies confirming that consuming eggs has nothing to do with heart disease or atherosclerosis. In fact people who consume eggs show lower risk of these health problems. The majority of

people do not know that 85% of blood cholesterol does not come from food but is produced by the liver in response to consumption of processed carbohydrates and sugar. So, these are the foods to avoid in order to protect your heart, not the eggs.

I suggest getting your eggs from a source you trust. Free-range organic eggs are the best because the hens have much better nutrition, are not fed antibiotics and agricultural chemicals and are exposed to sun and fresh air. Free-range organic eggs are also better from another important point of view - the concern about *Salmonella.* According to the National Egg Marketing Board around one in 7000 eggs may harbour *Salmonella.* These are the numbers for battery eggs laid by hens in cages. Salmonella-infected egg comes from an infected hen. Free-range organically reared hens are much less likely to have *Salmonella,* as they possess much healthier immune systems. Raw egg yolks are more nourishing than cooked. However, if you feel unsure about raw egg yolks, then cook the eggs whichever way you prefer. *Salmonella* gets destroyed when eggs are cooked thoroughly.

Egg whites are usually cooked well, simply because most of us don't like the taste of raw whites. Though one case of biotin deficiency was described in the literature where a person lived on a self-fashioned diet of raw egg whites, there is no conclusive evidence as to why we should not eat them raw as well. However, when it comes to egg allergy whites are usually the part of the egg which the majority of sufferers react to, because the whites contain very complex proteins and antigens. Egg yolks contain single amino acids, which virtually do not need digestion. That is why a lot of people with egg allergy can tolerate the egg yolks if carefully separated from the whites.

If a GAPS child or adult has a true allergy to eggs and must avoid them, you will find a lot of delicious egg-free recipes in the recipe section of the book. If there is no allergy eggs should be a regular part of your GAPS patient's diet.

Non-starch fresh vegetables

French artichoke, beets, asparagus, broccoli, Brussels sprouts, cabbage, cauliflower, carrots, cucumber, celery, marrow, courgette (zucchini), aubergine (eggplant), garlic, onions, kale, lettuce, mushrooms, parsley green peas, peppers of all colours, pumpkin, squash, spinach, tomatoes, turnips, watercress.

Frozen vegetables can be used, as long as they are not coated with starch, sugar or anything else. All vegetables should be peeled, de-seeded and cooked until diarrhoea has completely cleared. After that raw vegetables can be slowly introduced with meals or as snacks.

There is a plethora of publications on the virtues of eating vegetables, so we will not concentrate on this subject here. However, one point is important: organic vegetables are better than non-organic. I had patients who were getting persistent diarrhoea from eating particular vegetables until they switched to organic ones. A GAPS patient's sensitive digestive system would undoubtedly react to pesticides and other chemicals in non-organic vegetables.

All fruit, including berries

Fruit can be fresh, cooked or raw, dried (no sorbates, no sulphites, sugar, starch or anything else added), and frozen (providing there is nothing added to the fruit). If the patient has diarrhoea, avoid fruit initially. As the diarrhoea settles, start introducing cooked fruit (peeled and de-seeded prior to cooking). When the stool becomes consistently normal then you can slowly introduce raw fruit as a snack between meals. It is not a good idea to have raw fruit with the meals as the fruit may interfere with the digestion of meats.

Fruit should be ripe as unripe fruit has too much starch. For example, bananas have to have brown spots on their skins.

Avocado is a wonderfully nutritious fruit and the only fruit which combines with meats well. It is easy to digest and is particularly rich in nourishing oils. Make sure it is ripe and serve it with meats, fish, shellfish and salads. Great drinking smoothies for children can be made with avocado (lookin the recipe section).

Berries are wonderful powerhouses of nutrition. They are very rich in vitamins, minerals and a whole host of anti-cancer and detoxifying substances. All sorts of edible berries are allowed on the diet: strawberries, blueberries, raspberries, blackcurrants, redcurrants, whitecurrants, blackberries, elderberries, etc. However, do not give them to a person with diarrhoea. When the diarrhoea has cleared completely introduce berries gradually starting from cooking them or baking in pies and muffins. If cooked berries are well tolerated then go ahead with raw berries. In some cases when the digestive tract is too sensitive you have to remove the seeds by putting your cooked berries through a sieve.

Nuts and seeds

Walnuts, almonds, brazil nuts, pecans, hazelnuts, cashew nuts, chestnuts, peanuts, sunflower seeds, pumpkin seeds and sesame seeds. Nuts and seeds should be bought in their shells or freshly shelled. They should not be roasted, salted, coated or processed in any other way. Peanut butter with just peanuts and salt is allowed providing the person is not allergic to peanuts. A lot of peanut allergy is due to contamination with moulds and their toxins, so make sure to get good quality peanuts. Blanched ground almonds (nut flour) can be purchased for baking in health food shops.

Nuts and seeds are highly nourishing. They are very rich sources of some vital minerals, amino acids and fats: magnesium, selenium, zinc, omega-6 and omega-3 oils. Epidemiological studies show that people who regularly consume nuts and seeds have lower rates of heard disease, cancer and many other degenerative diseases.

This diet uses nuts and seeds extensively. However, they are fibrous and should not be introduced until the diarrhoea is settled. After the diarrhoea is cleared baking with ground nuts can be introduced. When baked products with ground nuts (nut flour) are well tolerated then raw nuts can be gradually and slowly introduced as snacks between meals. If for any reason ground almonds are not well tolerated you can try to bake with ground pecans, cashews or walnuts, which you will have to grind yourself.

Seeds also should not be used until the diarrhoea has settled. Sunflower seeds, pumpkin seeds and sesame seeds are best soaked in water for about 12 hours or slightly sprouted. This way they are much easier to "digest and are more nourishing. Sprinkle your soaked or sprouted seeds on salads and ready-made dishes. You can add them to your baking mixtures and grind to use as flour. You can use tahini (creamed sesame seeds) and pumpkin seed butter in your baking providing they are pure without any additives.

Beans and pulses

Dried white (navy) beans, lima beans (dried and fresh), string beans as well as lentils and split peas. Apart from the ones mentioned, all other beans are too starchy to give to GAPS patients and should be avoided. With dried beans, lentils and peas it is very important so soak them in water for at least 12 hours, drain and rinse well under running water to remove some harmful substances (lectins and some starches) before cooking. Do not use commercially available bean flours, as the beans are not usually

pre-soaked before grinding them into flour. In cases of nut allergy cooked and mashed white (navy) beans can be used instead of nuts in baking. Beans, lentils and peas should be avoided until the diarrhoea has cleared completely.

Honey

All natural honey is allowed. Cold-expressed honey is preferable because many honey producers heat it in order to speed up the process of extraction from the honeycomb, which damages some micro-elements in the honey. Try to buy your honey as unprocessed as possible. Honey is sweeter than table sugar and contains two monosaccharides: fructose and glucose, which the GAPS digestive system can handle. Use honey as a sweetener. In the initial stages of the diet try to limit all sweet things, including honey, because they may encourage growth of *Candida albicansin* the gut.

Before the introduction of sugar in the 17th Century honey was the only sweetener which humans used in their diet. At the end of the 17th Century sugar, being cheaper and more available, replaced honey in people's diet starting an era of sugar-related health problems.

Honey is far more natural for our bodies and far from damaging health has a lot of health-giving properties. It has been used as food and medicine for thousands of years. In Greek mythology honey was considered a "food fit for the gods". There are dozens of books written about health-giving properties of natural honey It works as an antiseptic and provides vitamins, minerals, amino acids and many other bio-active substances. Depending on the variety of flowers, which a particular honey has been collected from, different flavour and composition of nutrients and bio-active substances can be found in the honey. Traditionally it has been used to treat digestive disorders, chest and throat infections, arthritis, anaemia, insomnia, headaches, debility and cancer. It can be applied therapeutically to open wounds, eczema patches, skin rashes, skin and mouth ulcers and erosions.

Beverages

A GAPS child or adult should drink water, freshly pressed juices and meat/fish stock.

For an adult weak tea and coffee without milk is allowed. Tea and coffee must be freshly made, not instant. A slice of lemon in tea is beneficial.

Herbal teas are allowed as long as they are made from fresh single herbs and not from commercially available herbal tea bags. Freshly made ginger tea is a good digestive.

Some milk replacements are allowed; home-made almond milk and home-made coconut milk. Please look in the recipe section on how to make them.

Drinking water is a very healthy habit. Children should be encouraged to develop this habit. An adult on average should drink 1.5-2 litres of water a day It is not advisable to drink tap water unless it is filtered. Tap water is chlorinated and damages the gut flora balance. It is best to drink bottled mineral water or filtered water. A GAPS person's day should always start with a glass of still mineral or filtered water cold or warm to personal preference. A slice of lemon in the water is beneficial. The same should be drunk between meals. Drinking a lot of water with meals is not advisable, as it may interfere with digestion. It is better to drink warm home-made meat stock with meals, which stimulates production of digestive juices in the stomach.

Freshly pressed fruit and vegetable juices are highly recommended. They will speed up the detoxification processes in the body and support the liver. You will need to have a good juicer at home to make these juices. A good juicer often comes with a recipe book, but you can experiment with your own mixtures and combinations (look in the recipe section). For more on juicing look in the chapter *Detoxification for people with GAPS,*

Apart from freshly pressed juices I do not recommend any commercially available juices for a number of reasons. Commercial juices get pasteurised, which destroys a lot of nutrition in the juice and turns it into a source of processed sugar. Some commercial juices can be mislabelled by not mentioning added preservatives, sweeteners and other substances. Most commercially available juices are prone to having moulds and fungi in them, which GAPS people very often react to. It goes without saying that all cordials and other soft drinks have to be out of the diet.

Alcoholic beverages are best avoided by people with GAP Syndrome as it adds more toxicity for the liver to deal with However, on rare occasions a small amount of dry wine, gin, Scotch whisky, bourbon and vodka are permissible. Beer has to be completely avoided as it has a high content of starch.

Fats and oils

All natural fats on meats - lamb, pork, beef, poultry, etc.- are acceptable. These are the best fats to cook with because they do not change their chemical structure, when heated. All cooking oils or vegetable oils are full of harmful trans-fatty acids and should be avoided. Cooking should be done with butter, ghee, pork dripping, beef fat (lard), lamb fat, goose fat, duck fat or chicken fat. If you roast a duck collect the fat from the baking tray, put it through a sieve or a cheese cloth and you will have a large jar of excellent cooking fat. If you roast a goose you will have enough for half a year. You can bake with these fats too if you have any concerns about using butter and ghee in your baking. If you can find natural non-hydrogenated coconut oil, you can use it for cooking and baking. Unfortunately most brands of coconut oil available in the west are hydrogenated and best avoided.

Avoid all commercially available oils apart from virgin cold pressed olive oil. You should not cook with it as heating will destroy a lot of nutrients and change unsaturated fatty acids into trans-fats. Use it as a dressing on your ready served meals, salads and vegetables in ample amounts. Other cold-pressed oils, like flaxseed oil, evening primrose oil, avocado oil, etc., are very beneficial but, again, should never be heated.

Avoid all artificial fats like margarine and butter replacements. Avoid all foods cooked with these fats.

For detailed explanation about fats and oils please look at the chapter: *Fats, the good and the bad,*

A typical menu

Start the day with a glass of still mineral or filtered water with a slice of lemon. It can be warm or cold to personal preference. If you have a juicer your patient can start the day with a glass of freshly pressed fruit/vegetable juice.

A good juice to start the day is **40%** apple + **50%** carrot +**10%** beetroot (all raw of course). You can make all sorts of juice mixes, but generally try to have **50%** of therapeutic ingredients: carrot, small amount of beetroot (no more than **5%** of the juice mixture), celery, cabbage, lettuce, greens (spinach, parsley, dill, basil, fresh nettle leaves, beet tops, carrot tops), white and red cabbage, and **50%** of some tasty ingredients to disguise the taste of therapeutic ingredients: pineapple, apple, orange, grapefruit,

grapes, mango, etc. Your patient can have these juices straight or diluted with water.

Every day our bodies go through a **24** hour cycle of activity and rest, feeding and cleaning up (detoxifying). From about **4am** till about **10am** the body is in the cleaning up or detoxification mode. Eating fresh fruit, drinking water and freshly pressed juices will assist in this process. Loading the body with food at that time interferes with the detoxification. That is why many of us do not feel hungry first thing in the morning. It is better to have breakfast around **10am** when your body has completed the detox stage and is ready for feeding. At that stage we usually start feeling hungry. Children maybe ready for their breakfast earlier than adults.

Breakfast choices

- Eggs cooked to personal liking and served with sausages and vegetables, some cooked, some fresh as a salad (tomato, cucumber, onions, celery, any fresh salad greens, etc.) and/or avocado and/or meat. The yolks are best uncooked and the whites - cooked. Use plenty of cold pressed olive oil as a dressing on the salad and eggs. Mix a tablespoon of pre-soaked or sprouted sunflower and/or sesame and/or pumpkin seeds with the salad. Sausages (full fat) should be made of pure minced meat with only salt and pepper added. Make sure that there is no commercial seasoning or MSG (MonosodiumGlutamate) in the sausages. I recommend finding a local butcher, who would make pure meat sausages for you on order. If diarrhoea is present then the vegetables should be well cooked and the person should not have seeds at this stage.
- Avocado with meat, fish or shellfish, vegetables raw and cooked, lemon and cold pressed olive oil. Serve a cup of warm meat stock as a drink with food.
- Pancakes made with ground nuts. These pancakes are delicious with some butter and honey, or as a savoury snack. If you blend some fresh or defrosted berries with honey, it will make a delicious jam to have with pancakes. Weak tea with lemon, ginger tea or mint tea.
- Any of the home baked goods: muffins, fruit cake or bread.

Lunch

- Home-made vegetable soup or stew in a home-made meat stock.
- Avocado with meat, fish, shellfish and raw or cooked vegetables. Use

olive oil with some lemon squeezed over it as a dressing. Serve a cup of warm home-made meat stock as a drink.

- Any meat/fish dish made with vegetables.

Dinner

One of the dishes from the lunch or breakfast choice.

For snacks between meals your patient can have fruit, nuts and home-baked products.

A few words about vegetarianism

I had a few families where parents are dedicated vegetarians and want their children to be vegetarians as well. These cases are the most difficult to treat because after eliminating all grains, sugar and starchy vegetables from the diet there is not much left to eat. What these parents need to know is some statistics:

1. Vegetarian children are more prone to health problems than children who eat meat, particularly to psychomotor impairment.
2. Vegetarians are prone to muscle loss and bone damage. They, on average, have lower muscle strength.
3. According to census data vegetarians die younger than people who eat meat.

From my clinical observations I have yet to meet a healthy vegetarian. In the process of evolution we humans have evolved to be omnivores, eating everything we can find in the environment: plants, eggs and meats. Our physiology is designed to work on these foods. To be healthy and full of energy we require a substantial amount of protein every day. GAPS people are particularly in need of high-quality proteins from meats, fish and eggs because their digestive systems are not in a fit state to handle hard-to-digest proteins from plants. Imposing vegetarianism on your GAPS child will undermine his or her chance of recovery.

Vegetarians have every right to follow their beliefs and to make decisions about their personal eating habits. But I strongly advise not imposing these beliefs on your GAPS child! Get your child healthy and well first through using GAPS nutritional protocol! Then allow your child grow and be mature enough to make his/her own decision whether to be a vegetarian or an omnivore. After all our children have a right to chose for themselves!

Recommended foods

Almonds, including almond butter and oil
Apples
Apricots, fresh or dried
Artichoke, French
Asiago cheese
Asparagus
Aubergine (eggplant)
Avocados, including avocado oil
Bananas (ripe only with brown spots on the skin)
Beans, dried white (navy), string beans and lima beans
Beef, fresh or frozen
Beets or beetroot
Berries, all kinds
Black, white and red pepper: ground and pepper corns
Black radish
Blue cheese
Bok Choy
Brazil nuts
Brick cheese
Brie cheese
Broccoli
Brussels sprouts
Butter
Cabbage
Camembert cheese
Canned fish in oil or water only
Capers
Carrots
Cashew nuts, fresh only
Cauliflower
Cayenne pepper
Celeriac
Celery
Cellulose in supplements
Cheddar cheese
Cherimoya (custard apple or sharifa)
Cherries

Chestnuts
Chicken, fresh or frozen
Cinnamon
Citric acid
Coconut, fresh or dried (shredded) without any additives
Coconut milk
Coconut oil
Coffee, weak and freshly made, not instant
Collard greens
Colby cheese
Courgette
Coriander, fresh or dried
Cucumber
Dates, fresh or dried without any additives (not soaked in syrup)
Dill, fresh or dried
Duck, fresh or frozen
Edam cheese
Eggplant (aubergine)
Eggs, fresh
Filberts
Fish, fresh or frozen, canned in its juice or oil
Game, fresh or frozen
Garlic
Ghee, home-made
Gin, occasionally
Ginger root, fresh
Goose, fresh or frozen
Gorgonzola cheese
Gouda cheese
Grapefruit
Grapes
Havarti cheese
Hazelnuts
Herbal teas
Herbs, fresh or dried without additives
Honey, natural
fuices freshly pressed from permitted fruit and vegetables
Kale
Kiwi fruit

Kumquats
Lamb, fresh or frozen
Lemons
Lentils
Lettuce, all kinds
Lima beans (dried and fresh)
Limburger cheese
Limes
Mangoes
Meats, fresh or frozen
Melons
Monterey (lack) cheese
Muenster cheese
Mushrooms
Mustard seeds, pure powder and gourmet types without any non-allowed ingredients
Nectarines
Nut flour or ground nuts (usually ground blanched almonds)
Nutmeg
Nuts, all kinds freshly shelled, not roasted, salted or coated
Olive oil, virgin cold-pressed
Olives preserved without sugar or any other non-allowed ingredients
Onions
Oranges
Papayas
Parmesan cheese
Parsley
Peaches
Peanut butter, without additives
Peanuts, fresh or roasted in their shells
Pears
Peas, dried split and fresh green
Pecans
Peppers (green, yellow, red and orange)
Pheasant, fresh or frozen
Pickles, without sugar or any other non-allowed ingredients
Pigeon, fresh or frozen
Pineapples, fresh
Pork, fresh or frozen

Port du Salut cheese
Poultry, fresh or frozen
Prunes, dried without any additives or in their own juice
Pumpkin
Quail, fresh or frozen
Raisins
Rhubarb
Roquefort cheese
Romano cheese
Satsumas
Scotch, occasionally
Shellfish, fresh or frozen
Spices, single and pure without any additives
Spinach
Squash (summer and winter)
Stilton cheese
String beans
Swiss cheese
Tangerines
Tea, weak freshly made, not instant
Tomato puree, pure without any additives apart from salt
Tomato juice, without any additives apart from salt
Tomatoes
Turkey, fresh or frozen
TUrnips
Ugly fruit
Uncreamed cottage cheese (dry curd)
Vinegar (cider or white); make sure there is no allergy
Vodka, very occasionally
Walnuts
Watercress
Wine dry: red or white
Yoghurt, home-made
Zucchini

Foods to avoid

Acesulphame
Acidophilus milk
Agar-agar
Agave syrup
Algae
Aloe Vera
Amaranth
Apple juice
Arrowroot
Aspartame
Astragalus
Baked beans
Baker's yeast
Baking power and raising agents of all kind
Balsamic vinegar
Barley
Bean flour and sprouts
Bee pollen
Beer
Bhindior okra
Bicarbonate of soda
Bitter Gourd
Black eye beans
Bologna
Bouillon cubes or granules
Brandy
Buckwheat
Bulgur
Burdock root
Butter beans
Buttermilk
Canellini beans
Canned vegetables and fruit
Carob
Carrageenan
Cellulose gum
Cereals, including all breakfast cereals

Cheeses, processed and cheese spreads
Chestnut flour
Chevre cheese
Chewing gum
Chickpeas
Chickoryroot
Chocolate
Cocoa powder
Coffee, instant and coffee substitutes
Cooking oils
Cordials
Corn
Cornstarch
Corn syrup
Cottage cheese
Cottonseed
Cous-cous
Cream
Cream of Tartar
Cream cheese
Dextrose
Drinks, soft
Faba beans
Feta cheese
Fish, preserved, smoked, salted, breaded and canned with sauces
Flour, made out of grains
FOS (fructooligosaccharides)
Fructose
Fruit, canned or preserved
Garbanzo beans
Gjetost cheese
Grains, all
Gruyere cheese
Ham
Hot dogs
Ice-cream, commercial
Jams
Jellies
Jerusalem artichoke

Ketchup, commercially available
Lactose
Liqueurs
Margarines and butter replacements
Meats, processed, preserved, smoked and salted
Millet
Milk from any animal, soy, rice, canned coconut milk
Milk, dried
Molasses
Mozzarella cheese
Mungbeans
Neufchatel cheese
Nutra-sweet (aspartame)
Nuts, salted, roasted and coated
Oats
Okra
Parsnips
Pasta, of any kind
Pectin
Postum
Potato white
Potato sweet
Primost cheese
Quinoa
Rice
Ricotta cheese
Rye
Saccharin
Sago
Sausages, commercially available
Seaweed
Semolina
Sherry
Soda soft drinks
Sour cream commercial
Soy
Spelt
Starch
Sugar or sucrose of any kind

Tapioca
Tea, instant
Triticale
Turkey loaf
Vegetables, canned or preserved
Wheat
Wheat germ
Whey, powder or liquid
Yams
Yoghurt, commercial

3. RECIPES

1. Condiments
Ketchup
Guacamole
Mayonnaise
Salsa
Aubergine dip
Basic liver pate

2. Salads
Beetroot salad
Tuna salad
Salad with cabbage and apple
Salad with tomatoes and cucumber
Russian salad
Carrot salad

3. Soups
How to make a meat stock:
Lamb, pork, beef or game stock
Chicken stock
Fish stock
The basic soup recipe
A spring nettle soup
Russian Borsch
Fish soup
Meatball soup
The beautiful winter squash soup
Meat jelly

4. Fats for cooking
Ghee
Goose or duck fat
Pork, lamb or beef fat
Coconut oil

5. Main dishes
An Italian meat casserole
Stuffed peppers
Meatballs
Meat cutlets
Fish cutlets
Swedish Gravlax - the best way to eat fresh salmon
Baked beans or French Cassoulet
Casserole with turkey legs
Liver pudding
Liver in a clay pot
Quick liver recipe

6. Vegetables
Sauerkraut
A nice way to cook cabbage
Quick vegetable risotto
Cauliflower "potatoes"
Baked vegetables

7. Baking at home
The basic bread/cake/muffin recipe
Pizza

8. Desserts
Baked apples
Creme-caramel
Apple crumble
Apple pie
Winter squash cake
Cake Pinocchio
Peanut butter pie
Russian custard

Birthday cake
Ice-cream
Fresh coconut
Coconut sweets

9. Egg-free recipes
Egg-free bread/cake/muffin mixture
Egg-free banana muffins
Egg-free Easter Eggs
Egg-free crackers/biscuits
Egg-free fruit dessert
Egg-free apple pie
Egg-free cookies (biscuits)

10. Beverages
Nut/seed milk
Coconut milk
Ginger tea
Freshly pressed juices
Fruit smoothies

11. Yoghurt and crfeme fraiche
You can find many more recipes in Elaine GottschalTs book "Breaking the Vicious Cycle" and on the following sites on the Internet:

www.scdiet.org
www.breakingthevicioustycle.com
www.geocities.com
www.pecanbread.com
www.uclbs.org

I. Condiments

Most fresh salads can be dressed with olive oil and fresh lemon juice. When home-made yoghurt is well tolerated it can also be used as a salad dressing.

Ketchup

2 cups tomato juice
2-3 *tablespoons white vinegar*
honey to taste
bay leaf (optional)
salt and pepper to taste

Mix all the ingredients except the honey and simmer on the stove until thick, stirring often to prevent sticking. When almost the desired thickness, add honey to taste and complete cooking. Ladle into sterilised jars and seal immediately or place in small containers and freeze.

(Recipe courtesy of Elaine Gottschall)

Guacamole

2 ripe avocados
juice ofi orange
l clove of crushed garlic
small amount of water

In the food processor blend together all the ingredients. Reduce the amount of garlic, if the guacamole is too hot. Use as a dip for vegetables and a spread for home-made bread.

Mayonnaise

i whole egg
i cup olive oil or slightly more
i tablespoon white vinegar or fresh lemon juice
'U teaspoon dry mustard powder
salt and pepper to taste
a little honey to taste

Blend in your food processor for a few seconds: egg, lemon juice (or vinegar), mustard, salt, pepper and honey. While the machine is running,

add the oil in a fine stream. Do not add oil quickly; it should take at least 60 seconds. As mayonnaise thickens, the sound of the machine will deepen.
Suggestions:

Use to thicken gravy: add 2 tablespoons of mayonnaise to about 1 cup of meat stock and heat gently for about 1-2 minutes, stirring constantly.

Use as a base for tartar sauce by adding ¼ cup chopped dill pickles (unsweetened) and ¼ cup of chopped onion.

Use as mock Hollandaise sauce by adding grated cheddar cheese (if well tolerated). Spread over vegetables such as cooked cauliflower or broccoli. Cover and heat in oven.

Mix with home-made yoghurt (1 part mayonnaise, 1 part yoghurt) and use as salad dressing.

(Recipe courtesy of Elaine Gottschall)

Salsa

4 medium-size tomatoes
half a pepper (green, red, orange or yellow)
1 medium onion (white or red)
1-3 *cloves of garlic*
dill and parsley
olive oil
salt and pepper to taste

Put all ingredients into the food processor and chop coarsely. Can be served with meats and vegetables. You can also use it for cookingmeats. To do that bring salsa to simmer, add diced meat (beef, pork, lamb or chicken) and 3-4 tablespoons of butter (or goose/duckfat), cover and simmer for 30 minutes.

Aubergine dip

2 aubergines (eggplants)
salt
3 medium-size tomatoes
3-4 cloves of garlic
7? cup olive oil
fresh dill or parsley

Cut the aubergines into 1 cm-thick slices, rub well with salt and duck fat. Place on a baking tray and bake at 150°C for 30-40 minutes or until soft. Cool down.

In the food processor blend together the baked aubergines, tomatoes, garlic, herbs and olive oil. Serve with meats and fish and as a dip with vegetables.

Basic liver pate

wog liver
1 large onion finely chopped
3 cloves of garlic finely chopped

Fry the liver, onion and garlic in ghee (butter, goose or duck fat) until well cooked through. Blend in a food processor with mayonnaise.

To make variations you can add one of the following when blending:

- l raw tomato
- 4-5 cooked prunes (unsweetened and without stones)
- raw garlic
- greens (dill, parsley, basil)
- raw onion

- peeled, cored and grated apple

2. Salads

Salads should be served when diarrhoea is no longer present.

To increase the nutritional value of your salads it is good to sprinkle coarsely chopped walnuts or seeds on top. Seeds: sunflower seeds, pumpkin and sesame should be soaked in water over night. It makes them more nourishing and easier to digest.

Beetroot salad

8 small beetroots
'Is cup of shelled walnuts
2 cloves of garlic
8 dried prunes without stones
mayonnaise
7» teaspoon of salt

Wash the beetroots and cut all tops and ends off. Cook the beetroot by steaming until a knife goes through easily. Alternatively you can buy* already cooked beetroots (in water, not in vinegar!). Grate the beetroot

through a coarse grater. In the food processor chop together the walnuts, garlic and prunes. Mix well with the grated beetroot. Add salt, mayonnaise and mix. Enjoy with meats and vegetables.

Tuna salad

200g canned tuna in its own juice or water
1 large onion
2 large carrots
2 hard-boiled eggs
mayonnaise

Drain the tuna and mash with a fork. Chop the onion finely. Cook the carrots. Peel and chop the hard-boiled eggs.

On a flat dish put a layer of tuna (use half the tuna) and top it up with half of the chopped onion. Cover with mayonnaise. Grate one carrot on top and cover with mayonnaise. Make a layer of one chopped hard-boiled egg and cover with mayonnaise. Repeat with the same layers of tuna, onion, carrot and egg. Decorate on the top with some dill or parsley. Make sure that every layer is well covered with mayonnaise.

Salad with cabbage and apple

loog of white cabbage
i large apple
'h cup of home-made yoghurt or cremefraiche
1 teaspoon of honey
a pinch of salt
2 table-spoons of raisins

Grate the cabbage. Peel, core and grate the apple. Slightly fry the raisins in butter to make them soft. Mix honey and salt with yoghurt. Mix all ingredients together.

Salad with tomatoes and cucumber

2 tomatoes
% or a long cucumber
i stick of celery
spring onion
dill or parsley
salt

Cut cucumbers into 'U cm thick slices. Cut tomato into mouth-size pieces and slice the celery into small pieces. Sprinkle with salt. Chop the spring onions, dill and parsley. Mix all ingredients and dress with cold pressed olive oil.

Russian salad

'h long cucumber
1 large carrot cooked (steamed)
loog cooked meat or sausages (leftovers are good)
1 onion
2 hard-boiled eggs
2 tablespoons of sauerkraut (optional)
fresh dill and/or parsley
'Is teaspoon salt
mayonnaise
yoghurt or cr&mefraiche

Cut cucumber and carrot into small cubes. Cut the meat and/or sausages into small cubes. Finely chop the onion. Peel and cut the eggs into small cubes. Finely chop dill and parsley. In a separate pot mix mayonnaise and yoghurt in equal proportions and add salt Mix all ingredients together.

Carrot salad

i large carrot
i tablespoon of raisins
i tablespoon of coarsely chopped walnuts
yoghurt

Slightly fry the raisins in butter to make them soft. Finely grate the carrot. Mix the carrot, raisins, walnuts and yoghurt.

3. Soups

I strongly recommend to making your soups based on a home-made meat \ stock. Meat stock aids digestion and has been known for centuries as a!J healing folk remedy for the digestive tract. Also home-made meat stock is ; extremely nourishing, it is full of minerals, vitamins, amino-acids andl

various other nutrients in a very bio-available form. Do not use commercially available soup stock granules or bouillon cubes, they are highly processed and are full of detrimental ingredients.

Once you have made your meat stock, it can be frozen or it will keep well in a refrigerator for at least a week. You can make soups, gravies and stews with this meat stock or warm up a cup of it to give your GAPS patient as a drink with meals or between meals. If you make sure that you always have some meat stock in your fridge, you will find that it is very easy and quick to make nourishing meals for your GAPS child or adult and the rest of the family.

You need meat and bones to make a good meat stock. Beef, lamb, pork, game, poultry and fish are all highly suitable and will make stocks with different flavours and different nutritional compositions. So, make sure that you alternate between different meats to provide a whole spectrum of nourishment. Bones and joints are particularly important as they enrich the stock with the kind of nourishing substances which meat alone cannot provide. In fact it can be very inexpensive to make a good quality meat stock as you use the parts of the animal which butchers usually give away almost free. The meat and bones can be fresh or frozen and there is no need to defrost them prior to cooking. Apart from bones and meat all you need is a large pot full of water and a bit of salt and pepper.

How to make a meat stock

Lamb, pork, beef or game

Put the joints, bones and meat into a large pot, add 5-10 pepper corns, add salt to taste and fill it up with water. Heat up to a boiling point. Cover the pan, reduce the heat to a minimum and simmer for 3 hours at least. The longer you cook the meat and bones, the more they will "give out" to the stock and the more nourishing the stock will be. Take the bones and meat out and pour the stock through a sieve into a separate pan to remove any small bones and pepper corns.

Chicken stock

Put a whole or half a chicken into a large pot, fill it up with water, add salt and heat it up to boiling point. Simmer for 1V2-2 hours. Take the chicken out and put the stock through a sieve. Keep in the refrigerator. The chicken, cooked this way is delicious and can be served for dinner with vegetables and a hot cup of your freshly made chicken stock.

Fish stock

To make a good fish stock you need bones, fins, skins and heads of the fish, not the meat. So buy your fish whole, cut the meat off to cook as a separate meal and use the rest of the fish to make your fish stock. Your fishmonger can do all the trimming for you. Put the heads, bones, fins and skin of the fish into a large pan, add 8-10 pepper corns and fill the pan with water. Bring up to boil, reduce the heat to a minimum and simmer for i-i7₂ hours. Add salt to taste at the end of cooking. Take the fish out and sieve the stock. Take the meat off the fish skeleton to use for soup making.

The basic soup recipe

To make a soup bring some of your home-made meat stock to the boil, add chopped or sliced vegetables and simmer for another 20-25 minutes. You can choose any combination of available vegetables: onion, cabbage, carrot, broccoli, cauliflower, pumpkin, courgettes, marrow, squash, leeks, etc. If you are planning to blend your soup, then you can cut vegetables roughly into any size pieces. If you prefer to have your soup without blending, then make sure that you cut or dice your vegetables into nice small pieces before cooking. If your meat stock was made with lamb, pork or beef you can add a handful of dried French or Italian mushrooms for a wonderful flavour. It is customary to crush the dried mushrooms by hand before adding to the soup. At the end of cooking add 1-2 table spoonfuls of chopped garlic, bring to the boil and turn the heat off. Blend with a soup blender until smooth unless you planned to have it without blending.

You can serve your soup with any combination of the following:

- some chopped parsley, coriander or dill
- hard-boiled egg cut into pieces
- a spoonful of your home-made goat's yoghurt or creme fraiche
- cooked meat cut into small pieces
- red onion cut into very small pieces
- spring onion cut into small pieces
- a spoonful of cooked and ground liver

From this basic recipe you can improvise and develop your own recipes. Here I will just provide a few ideas.

A spring nettle soup

i'L I of home-made meat stock
large bunch of spring nettles
2 tablespoons of dried French of Italian mushrooms
1 medium onion
1 medium carrot
2 courgettes or 7, of a marrow or squash
4 eggs, hard boiled

Young shoots of stinging nettles appearing in spring are full of wonderful nourishment. They are high in iron, magnesium, copper, zinc, vitamin C, carotenoids and other useful substances. For this recipe collect a large bunch of spring nettles. You will have to wear gloves and a long-sleeved shirt to do this. Rinse the nettles and shake the excess water off. Using scissors cut the leaves and tender shoots of the nettles into small pieces discarding the hard stems. Reserve for the recipe.

Cut the marrow, squash or courgettes into small cubes, thinly slice the carrot and chop the onion. Bring the home-made meat stock to a boil. Add all the vegetables and the French or Italian dried mushrooms, crumbling them with your hands before adding to the meat stock. Simmer under a tight lid for 15-20 minutes. Add your prepared nettles, mix and immediately take off the heat. Serve with 1-2 tablespoons of hard-boiled egg cut into small pieces and a spoonful of home-made yoghurt (if well tolerated).

Russian Borsch

tit I of home-made meat stock
1 medium onion finely chopped
1 medium carrot finely sliced
'U of medium-size white cabbage finely sliced
2 medium-size beetroots or4 small beetroots raw or cooked
3 cloves of garlic
1 finely chopped tomato

<u>If the beetroot is cooked (in water, not in vinegar):</u>
Bring the meat stock to boil and add the onion, carrot and cabbage. Cover and simmer for 20 minutes. In the meantime slice the cooked beetroots into long thin strips. Add into the soup, mix well and simmer for another 5 minutes. Take off the heat. Crush the 3 cloves of garlic and add to the soup

together with the chopped tomato. Serve with a large spoon of creme fraiche or home-made yoghurt (if well tolerated) and some chopped parsley and/or a thick slice of hard-boiled egg.

If the beetroot is raw:

Wash and peel the beetroot. Slice into long thin strips by hand or using your food processor. Bring the meat stock to boil and add the beetroot. Simmer for **10-15** minutes, then add the rest of the vegetables (onion, carrot and cabbage). Simmer for further **20** minutes or until the cabbage is cooked. Take off the heat. Crush the **3** cloves of garlic and add to the soup together with the chopped tomato. Serve with a large spoon of creme fraiche or home-made yoghurt (if well tolerated), some chopped parsley and/or a thick slice of hard-boiled egg.

Fish soup

1 l of home-made fish stock
1 large onion finely chopped
1 carrot thinly sliced
1 courgette or an equivalent amount of marrow or squash, cut into small cubes

Bring the fish stock to boil and add the onion, carrot and squash, marrow or courgettes. Simmer under a lid for **10-15** minutes and take off the heat. Add the cooked fish meat which you took off the bones when you made the fish stock. Serve with a spoonful of home-made yoghurt (if well tolerated) and/or with a hard-boiled egg (sliced or chopped).

If there is no meat left on the bones you can use the meat (skinless and boneless) of any available fish. Cut the meat into small cubes and add into the boiling fish stock at the same time as vegetables.

Meatball soup

400 g of minced meat (mixture of pork and beef is best)
1 large onion finely chopped
1 large carrot thinly sliced
1 cup winter squash or courgette cut into small cubes
1 cup of finely chopped cabbage (optional)
2 tablespoons of chopped garlic

In a pan bring **2** litres of water up to boil. Add salt and cayenne pepper to taste.

With your hands shape meatballs about **2** cm in diameter and add them, one at a time, into the boiling water. Cover and simmer on low heat for **30** minutes. Add all the vegetables apart from garlic, cover and simmer for another **20** minutes. Add the garlic and switch the heat off. Let it sit for **5-10** minutes then add **2-3** tablespoons of sauerkraut. Serve with a spoonful of home-made yoghurt and finely chopped dill.

lite beautiful winter squash soup

tiL I of home-made meat stock (turkey or chicken stock work best for this recipe)
1 leak, washed and sliced
broccoli, 3-4 medium sized rosettes
1 medium-size carrot, sliced
Va *of a medium size buttercup squash ora'h of butternut squash or any winter squash with sweet orange flesh*
3 garlic cloves peeled

Peel and de-seed the squash, cut it into chunks. Wash and cut into pieces all the vegetables. Put them into your soup pan, add the meat stock and bring to boil. Reduce the heat to a minimum, cover with the lid and simmer for about **30** minutes. Blend with a soup blender. If your family is at the stage of tolerating home-made goat's yoghurt, then add *'h* a cup into the soup. Serve warm. It is particularly soothing if the child has a tummy ache or diarrhoea.

Meat jelly

pig trotters (2-4)
1 large carrot
garlic
salt and black peppercorns

Put pig trotters into a large pan, fill it up with water, add salt and a teaspoon of black peppercorns. Bring up to boil, reduce heat to a minimum, cover with a lid and let it simmer for **3** hours.

In the meantime cook a large carrot by steaming, cool it down and cut into thin slices. You can cut it into decorative slices if you have the tools for doing that.

When the meat stock is ready take the pig trotters out and pour the stock

through a sieve into a separate pan. Let the trotters cool down completely. Take all the meats (including the skin and other soft tissues) from the pig trotters, completely stripping the bones. Cut the meat into small pieces.

In a large deep tray lay the pieces of meat, the carrot pieces and thin slices of garlic. You can add more or less garlic to your family's taste. Pour the meat stock to fill the tray to *L* Place it in the refrigerator for the jelly to set. You can also set this jelly in different jelly shapes and dishes as individual servings.

This dish is wonderful to have on a hot summer's day. It contains a lot of nourishing substances, including gelatine, glucosamine, glycoproteins, phospholipids and others and is considered to be a folk remedy for digestive problems.

4. Fats for cooking

Cooking (roasting, frying, etc.) should be done with fully saturated fats, because these fats do not alter their chemical structure when heated. These fats are: pork dripping, goose fat, duck fat, natural lard, lamb fat, coconut oil, butter and ghee. You can purchase many of these fats in shops. It is also easy to make many of these fats at home which has an advantage: you know exactly what is in it. For more information on this subject please look in the chapter: *Fats: the good and the bad.*

Ghee

Ghee is a clarified butter. It is traditionally used in many cultures around the world for cooking and baking. Butter can be used for cooking very effectively. However, small amounts of whey in the butter often burn. Also whey contains lactose and some milk proteins, which many GAPS patients have to avoid in the initial stages of the diet. Ghee on the other hand does not contain any whey, milk protein or lactose at all, just milk fat, and does not burn.

Preheat your oven to around **6o-i20**°C **(250**°F). Put a large block of organic, preferably unsalted butter into a metal dish or pan. Leave it in the oven for **45-60** minutes. Take it out and carefully pore the golden fat from the top (ghee), making sure that the white liquid at the bottom stays in the pan. Discard the white liquid. Keep in glass jars and refrigerate.

Goose or duck fat

Roast a goose or a duck in the oven in the usual way. Take the bird out and pour the fat through a cheese-cloth or a fine metal sieve. Keep in glass jars

and refrigerate. Use for cooking meats and vegetables. These fats give a nice flavour to roasted vegetables in particular.

Pork, lamb or beef fat (lard)

You can collect these fats in much the same way as the duck and goose fats. You need any bits of fat from the animal. It is particularly good to use internal fat layer from the animal, which the butcher often gives away almost free. You will be amazed how much cooking fat you will collect from a fairly small piece. It is wise to use organic animals for this purpose, as fat is a natural body storage for various toxins. Investing in a small piece of organic fat once or twice a year will not cost you much and will last for many months.

Roast the fat on a fairly low heat **(i2o-i30**°C) for **2-3** hours depending on the size of the piece. Pour the fat through the cheese-cloth or a fine metal sieve. Store in glass jars and refrigerate.

Coconut oil is very good for cooking. It contains largely saturated fats and hence does not change its chemical structure, when heated. However, make sure that you buy good quality natural coconut oil, as a lot of brands, sold in the west have been hydrogenated to increase shelf-life.

5. Main dishes

An Italian meat casserole

This is an alternative way of making an excellent meat stock as well as preparing a meal for the whole family. You can use any of the following: a leg or a shoulder of lamb, a joint of pork, a joint of beef, a pheasant, **2-4** pigeons, **2** quails, a joint of venison, a whole chicken, turkey legs. You need a large casserole with a lid for this dish. Put your meat joint or a whole bird(s) into the casserole, add water to fill % of the casserole, add some salt, pepper corns, dried herbs to taste, bay leaves and a sprig of rosemary. Cover with the lid and put into the oven for **5-6** hours on low heat **(125-140**°C or **250**°F). Add various vegetables **40-50** minutes before your dinner time into the casserole: rosettes of broccoli and cauliflower, whole peeled small red or white onions, Brussels sprouts and large pieces of carrots. When ready take the meat and vegetables out and serve to your family. Put the meat stock through a sieve and serve it in bouillon cups with the dinner. Meat stock left from this dinner will keep well in the refrigerator and can be used for making soups or warming up as a nourishing drink.

Stuffed peppers

6 large peppers (a combination of green, red, yellow and orange)
7 kg of minced meat (a mixture ofL pork and'L beef is best)*
2 medium-size carrots
I large onion
salt and pepper

Grind the carrots and chop the onion. Mix them well together with the minced meat adding salt and pepper to taste.

Cut off the tops of the peppers and take out the seeds. Fill the peppers with the mixture of the meat and vegetables. Place the stuffed peppers upright into a pan. You will need the correct size pan to fit all the peppers, so they stand upright and support each other. Add **3-4** cups of water to the bottom of the pan and cover it with the lid. Bring up to boil, reduce the heat to a minimum and simmer for an hour. Serve a pepper per person with a ladle of the stock from the bottom (best to serve in a soup bowl}. Put a tablespoon of your home-made yoghurt (if well tolerated) with a clove of crushed garlic mixed into it. Garnish with chopped parsley.

Meatballs

500g of minced meat (a mixture of pork and beef is best)
1 large onion
'h red pepper
1 courgette
2 tablespoons of chopped fresh garlic
1 tablespoon tomato puree
salt, pepper, 2-3 bay leaves

To make the sauce cover the bottom of the pan with water **3-4** cm high. Mix into the water tomato paste, salt and pepper. Bring to boil. With your hands shape balls out of the mincemeat about **4** cm in diameter. Put the balls one at a time into the boiling sauce. Make sure that you use a large enough pan to fit all the balls in one layer. Cover with the lid and simmer on low heat for **30** minutes.

In the meantime prepare the vegetables. Finely chop the onion and red pepper. Cut the courgette into small cubes. Chop the garlic.

After cooking the meatballs for **30** minutes add the chopped onion, pepper and courgette, mix with the sauce gently in order to preserve the

shape of the meatballs. Cover and cook for another 25 minutes. Add the bay leaves and garlic. Cover and turn the heat off. Let it sit for 10 minutes before serving. Sprinkle with finely chopped coriander and serve with cooked vegetables.

Meat cutlets

500g of minced pork
500g of minced beef or lamb
1 large onion, finely chopped
salt and pepper

Mix all the ingredients well and make oval shaped cutlets. In a frying pan warm up some pork dripping (goose or duck fat) and fry the cutlets slightly on both sides. Place the cutlets into a greased baking tray add 7₂ a cup of water and bake in the oven for 40 minutes at 150-170*0 (300-350°F). Serve with cooked vegetables and a salad.

Fish cutlets

2-3 fairly large freshwater or sea fish, a mixture of different fish works very well

3-5 tablespoons of butter (ghee, goose fat, duck fat, pork dripping or coconut oil)
1-2 cups of shredded coconut
salt and pepper

Cut all the meat off the fish, remove skin and large bones. Use the bones, heads and skin for making a very nourishing fish stock (recipe in the *soup* section). Alternatively you can buy fish fillets already without skin and large bones.

In the food processor put the meat of the fish, one egg, butter, salt and pepper to your taste and grind it to make mince. If you have a meat mincer it will do the same job for you. With your hands make oval-shaped flat cutlets about 2 cm thick, roll them in shredded coconut and slightly fry them on both sides. Use coconut oil (or butter, ghee, pork dripping, lard, goose fat or duck fat) for frying. Move the cutlets into a large oven tray, greased with any of the mentioned fats. Add half a cup of water and put into preheated oven. Bake for 20-30 minutes at iso°C (300T).

Swedish Gravlax - the best way to eat fresh salmon

skinless and boneless salmon fillet
11 water at room temperature
th tablespoons of salt
1 tablespoon of honey
fresh dill and coarsely ground black pepper

The fish has to be very fresh. Cut the fish into **0.5cm** thick slices and place in a dip tray (any baking tray will do). Sprinkle with finely chopped dill and black pepper. Dissolve the salt and the honey in the water to make a brine. Cover the fish with the brine and leave at room temperature for l-i'A hours. Pour the water out and serve the fish with some lettuce and mayonnaise.

This dish works particularly well with wild salmon. Because the fish is not cooked all the essential fatty acids and other nutrients are preserved. Refrigerate and consume within two days.

Baked beans or French Cassoulet

soog white (navy) beans
1 duck
1 tablespoon cider vinegar
1 teaspoon sea salt
2 tablespoons tomato puree
cayenne pepper and black pepper
5-6 bay leaves, a sprig of rosemary, a teaspoon of thyme

Soak the beans in water for **12-24** hours, drain, rinse well in cold water and drain again.

Cut all the meat from the duck: the legs, wings, breasts and all the fat. Cut the meat into chunks and the fat into small pieces. The carcass of the duck and the giblets you can use for making meat stock later.

In a large pan put **2** litres of water, cider vinegar, sea salt, tomato puree, a pinch of each cayenne pepper and black pepper, bay leaves, rosemary and thyme. Mix in the beans and the duck pieces (the meat and the fat). Cover the pan with a lid and put it into an oven. Cook at **i2o**°C **(25o**°F) for **4-5** hours. Check occasionally. If the beans are getting dry, add more water.

Serve hot. The baked beans left from this meal will keep in the fridge for a long time and can be served with other dishes.

Casserole with turkey legs

2 turkey legs
11 of water
l heaped tablespoon of tomato puree
1 teaspoon of salt
6-io pepper corns
a pinch of cayenne pepper
fresh or dried herbs: oregano, rosemary, bay leaves
a combination of available vegetables: choose from carrots, winter squash, pumpkin, courgette, marrow, peeled small/medium onions, cauliflower, broccoli, peppers, aubergine and Brussels sprouts

In a large oval casserole put the water, salt, tomato puree, pepper corns, cayenne pepper and herbs. Mix well. Put the turkey legs in. Brush the parts of the turkey legs, which are not covered with the water, with some goose fat (or duck fat, ghee, pork dripping or lard). Do not cover the casserole with the lid, leave it open. Cook in the oven at **i5o**°C **(3oo**°F) for **2-2***4 hours. About **5ominutes** before the end of cooking add available vegetables, cut into large chunks. Mix them well into the sauce and leave cooking. When the vegetables are cooked so a sharp knife goes through them easily, take the casserole out. Serve the meat and the vegetables with some freshly chopped parsley and garlic.

Liver pudding

loog liver (calf or lamb)

2 tablespoons of butter (or ghee, goose/duck fat)
l medium-size onion
salt
parsley

Soak the liver in water with some lemon juice or home-made yoghurt for a few hours to remove any bitter taste. You can also soak the liver in the liquid left from draining your home-made yoghurt. Wash the liver, dry with a paper towel and blend in the food processor into a pulp. Put through a sieve to remove any hard bits. Add salt, egg yolk, butter, finely chopped parsley and finely chopped onion. Whip the egg white stiff and fold into the mixture. Put the mixture into a suitable dish, cover with a sheet of baking

paper and cook with steam. You can use a steamer or a large pan. To steam in a pan put some water at the bottom of the pan and place the dish in it. Make sure that you don't have too much water in the pan, so it does not get into the dish with the liver. Cover the pan with a lid and put it on the stove. Steam for about one hour. Serve with cooked vegetables or vegetable risotto.

Liver in a clay pot

loog liver (calf or lamb)
loog lamb's hearts
1 large onion
10 dried prunes with stones
i large pot of natural yoghurt or soured cream (you can useyourhome-madeyoghurt or replace with 1h cup ofbutter I ghee)
a pinch ofallspice, salt, pepper

Soak the liver in water with some lemon juice or home-made yoghurt for a few hours to remove any bitter taste. You can also soak the liver in the liquid left from draining your home-made yoghurt. Wash, dry and cut into small pieces using scissors. Cut lamb's hearts into small pieces using scissors. In a suitable size clay pot put the liver and lamb's heats, finely chopped onion and prunes. Into the yoghurt add salt, pepper, allspice and mix well. Add into the clay pot and mix with the meats. Cover the pot with the lid or foil. Bake in the oven for about l hour at i6o°C **(320**°F),

Quick liver recipe

loog liver
I large onion
6-7 cloves of garlic
'/2 cup ofbu tterlghee (use goose/duck fat if avoidingbutter)
fresh parsley or dill

Soak the liver in water with some lemon juice or home-made yoghurt for a few hours to remove any bitter taste. You can also soak the liver in the liquid left from draining your home-made yoghurt. Wash and dry the liver and cut into small pieces using scissors. In a frying pan melt the butter/ghee, add the sliced onion and finely chopped garlic. Fry slightly until the onion and garlic start turning golden. Add the liver, salt, pepper

and stir-fry for about **4-5** minutes. Sprinkle chopped parsley or dill on top and drizzle with olive oil. Serve immediately.

6. Vegetables

Cooked vegetables are nourishing, warming and easy to digest, they are gentle on the gut lining and should be a regular part of the diet. You can cook your vegetables by steaming, stir-frying, stewing, roasting, grilling or as a soup. Instead of boiling vegetables I recommend steaming them as boiling removes a lot of nutrients into the water which then gets thrown away. The best vegetables to steam are broccoli, cauliflower, Brussels sprouts, fresh green beans (runner beans, string beans, etc.) carrots, asparagus, French artichokes and beetroot.

If diarrhoea is not present raw vegetables should also be a normal part of every meal, they would provide a lot of active enzymes, which will help you to digest your food. Carrots, cucumber, tomato, greens, cabbage, onion, garlic, lettuce, baby spinach, celery, cauliflower can all be served as salads or cut into rosettes and sticks to eat with a dip (mayonnaise, guacamole, liver pate, aubergine dip, etc).

Sauerkraut

Sauerkraut is a fermented white and/or red cabbage, commonly consumed in Germany, Russia and Eastern Europe. It is a wonderful healing remedy for the digestive tract full of digestive enzymes, probiotic bacteria, vitamins and minerals. Eating it with meats will improve digestion as it has a strong ability to stimulate stomach acid production. For people with low stomach acidity I recommend having a few tablespoons of sauerkraut (or juice from it) **10-15** minutes before meals. For children, initially add **1-3** tablespoons of the juice from the sauerkraut into their meals.

Slice thinly a medium-size white cabbage and add two shredded carrots. You can use red cabbage or a mixture of white and red. Add salt to taste. Knead the mixture well with your hands until a lot of juice comes out. Pack this mixture into a suitable glass or stainless steel bowl, press it firmly so there is no air trapped and the cabbage is drowned in its own juice. Place a plate on top of the cabbage, which is about lcm smaller in diameter than the bowl. The gap will allow the fermentation gases to escape. On top of the plate place something heavy enough to keep the cabbage constantly submerged in its juice. Cover the whole thing with a kitchen towel to keep it in

the dark. It should take **5-7** days inside the house for the sauerkraut to be ready, (it will take two weeks in a cool place, like a garage). Sauerkraut is delicious with any meal and it can be added to your homemade soups and stews.

A nice way to cook cabbage

½ a cabbage finely sliced
1 large carrot finely sliced
¼ onion finely chopped
1 tomato finely chopped
1 tablespoon of chopped garlic
salt and pepper to taste

Cover the bottom of the pan with home-made meat stock and bring to the boil. Add cabbage, carrot, onion, salt and pepper. Cover and cook on a low heat for **30** minutes. Add the chopped tomato and garlic, mix, cook for another **3** minutes and take off the heat. Mix in ¼ cup of home-made yoghurt or soured cream. Serve with meat.

Quick vegetable risotto

2 courgettes or a quarter of a medium-size marrow
1 large onion
10 cloves of garlic
1 pepper red, yellow or green (or a combination of different coloured peppers)
1 tablespoon of tomato puree
salt and pepper

In a frying pan melt about **50g** of butter. Mix in sliced courgettes or marrow, onion, garlic, sliced peppers, tomato puree, season to taste with salt and pepper. Cover with a lid and leave for **10** minutes on minimum heat. Alternatively you can stir-fry it on a low heat. Mix well and serve with plenty of cold pressed virgin olive oil and freshly chopped dill or parsley. Enjoy with meat and fish.

Cauliflower "potatoes"

1 large cauliflower cut into pieces
V< cup butter or l, cup home-made yoghurt
salt, pepper to taste
parsley and paprika garnish

Cook cauliflower until just tender. Drain.

Puree in blender or food processor. Add butter or yoghurt, salt and pepper and blend thoroughly. Reheat and serve. Garnish with parsley and paprika.

The pureed cauliflower may be placed in a baking dish, sprinkled with grated cheddar cheese and heated in the oven until the cheese melts.

(Recipe courtesy of Elaine Gottschall)

Baked vegetables

You can bake any combination of the following vegetables:
onions, white or red or shallots
peppers, red, yellow, orange or green
Brussels sprouts
courgettes or marrow
pumpkin
winter squashes
large mushrooms
turnips
aubergines (eggplant)

Peal the onion and cut into halves or quarters. Shallots do not need to be peeled, just bake them in their skins.

Cut the peppers into quarters, remove seeds.

Peel the outer leaves from Brussels sprouts.

Peel and cut into large chunks courgettes, marrow and pumpkin. Remove the seeds from the pumpkin and the marrow. Rub courgettes and marrow with salt.

Peel and slice winter squash, remove the seeds.

Peel the turnips and cut like potato chips.

Cut the aubergine into chunks and rub with salt.

Rub plenty of goose or duck fat on the vegetables, place them in a baking tray and bake at **150**°C **(300**°F) for **20-40** minutes or until a sharp knife goes through easily. Serve with meat or fish.

The basic breadlcakelmuffin recipe

2% cups of ground almonds
'/4 cup of softened butter (or coconut oil, goose fat, duck fat or home-made yoghurt or cr^me fraiche)
3 eggs

Ground almonds you can buy in most health food shops. Instead of ground almonds you can use walnuts, pecans and hazelnuts, which you can grind in your food processor to a flour consistency.

Mix all the ingredients well. You may want to add more or less ground almonds to reach porridge-like consistency. Grease your baking pan with butter or ghee, line it with greased baking paper and put the mixture into it. Bake in the oven at **150**°C **(300**°F) for about an hour. Check occasionally with a dry clean knife, if the knife comes out dry then the bread is ready.

To make variations of this bread you can add some salt, pepper, dried herbs, tomato puree, grated cheddar cheese (if well tolerated), nuts, seeds, dried fruit, fresh or frozen berries, chunks of cooking apple, grated carrot, chunks of pumpkin (without the skin and seeds). If you want to sweeten the mixtureadd Vz cup of honey into it and/or i7» cups of dried fruit (dates, apricots, raisins, figs) and/or **2** ripe bananas. If the dried fruit is too hard, soak it in water for a few hours to soften.

Improvise, try to make your own variations. You can bake this mixture as a bread or cake or in small paper cups as muffins or make a pizza base. It really is very easy and manageable even for the most inexperienced cooks.

Pizza

Make a pastry following the previous recipe. Spread it on a baking tray covered with greased baking paper in a layer about **2** cm thick. Bake in the oven at **i50**°C **(3oo**°F) for about **30** minutes. Check with a dry knife if it is ready

Cool down. Spread tomato puree on the top and sprinkle with salt.

On top of the tomato puree you can put your choice of filling: slices of red/yellow/green pepper, mushrooms, pieces of cooked meat or sausages, slices of tomato, chopped greens, anchovies, fish, prawns and pineapple, etc.

Put grated hard cheese (cheddar and/or parmesan) on top of your filling

if your patient is at the stage when he or she can tolerate cheese. If the cheese is not tolerated then you can use home-made mayonnaise instead.

8. Desserts

Baked apples

With a sharp knife scoop out the cores with the seeds from large cooking apples. Fill each apple with a teaspoon of honey a teaspoon of butter, ground or coarsely chopped apricot kernels (or walnuts, or any other available nuts, or desiccated coconut). Add a dried apricot per apple (optional) cut into small pieces. Bake in the oven **ati6o-i8o**°C **(32o-36o**°F) for **20-25** minutes.

Crbme-caramel

For one person you need:

3 tablespoons of water
1 teaspoon of honey
ground cinnamon

Multiply the ingredients per number of people you want to serve.

Mix all the ingredients well. Pour into shallow ramekin dishes (or any other small terracotta dishes): you need one ramekin dish per person. Sprinkle some cinnamon on top. Preheat the oven to **i50**°C **(300**°F). Bake for **30-40** minutes.

Apple crumble

4 cooking apples
2 eggs
carrot pulp from juicing 2 lb. of carrots on lb carrots, very finely chopped
10 dried apricots
% a cup of honey
% a cup ofunsalted butter

Cut the apples into pieces and place on the bottom of your baking dish. Chop dried apricots into small pieces.

Mix together eggs, butter, carrot pulp, chopped dried apricots and honey. Put the mixture on top of the apples, mix slightly with the apples. Bake in the oven at **150** °C **(30o**°F) for approximately **40** minutes.

Apple pie

4 large cooking apples
a handful of raisins
½ cup of honey
1 cup of fresh or frozen blackcurrants
fresh pumpkin peeled and finely chopped, 2-3 cups
pitted dried dates, 2 cups
1 cup of hazelnuts
'I2 cup of ground almonds

Soak the dates in **2** cups of water for **2-3** hours. Drain the dates and reserve. Put the soaking water into your baking dish. Add cored and sliced apples, raisins and blackcurrants. Spread them evenly and sprinkle with the ground almonds. Pour honey on top spreading evenly.

In a food processor blend the dates, pumpkin and hazelnuts. Spoon out this mixture on top of the pie spreading evenly. Slightly press and smooth with a spoon or a knife so that the top looks like the top of a pie. Bake at **150-170**°C **(300-350T)** for an hour.

Winter squash cake

6 eggs
2 cups of grated (packed tightly) winter squash with sweet orange flesh (buttercup, butternut or other)
'/? a cup of honey
⅞ cup ofbutter (or ghee, coconutfat, goose fat or duck fat)
3 cups of ground almonds
3 medium-size apples

Grease your baking dish and cover the bottom with apples, cored and cut into slices. If your patient's digestive system is sensitive, then peel the apples. Otherwise you can leave the skins on.

Blend the rest of the ingredients in your blender and put the mixture on top of the apples. Smooth the top and bake at **i50**°C **(3oo**°F) for **40-50** minutes.

Cake Pinocchio

2 cups of shelled hazelnuts
1 cup of honey (250ml)
4 eggs
50g unsalted butter, preferably organic
4 tangerines to decorate

Preheat the oven to **175-200**°C **(350-400**°F).

Roast the hazelnuts in the oven and rub their skins off. Reserve **1** cup of the nuts for the cream and grind the rest into a coarse flour.

Make **4** circles out of baking paper large enough to fit on a large cake dish and grease them with butter. Separate the whites of the eggs from the yolks. Whip the egg whites stiff with half of the honey. Carefully fold in the ground hazelnuts. Spread the mixture on the four baking paper circles and bake for **5-10** minutes. Cool down and remove the baking paper.

Cream. Soften the butter by leaving it in the room for a few hours. Whip the **4** egg yolks with the rest of the honey until they increase in volume and become pale whitish in colour. Beat in the butter gradually, adding it in small amounts.

Coarsely chop the rest of the hazelnuts, reserving **10-15** whole nuts for decorating.

Layer the meringue circles with the cream, sprinkling every cream layer with the coarsely chopped hazelnuts. Cover the top with a thin layer of the cream. Peal the tangerines and separate them into segments. Decorate the top with the segments of tangerines and the **10-15** whole hazelnuts. Refrigerate.

Peanut butter pie

6 eggs
2 tablespoons of butter
1 cup of peanut butter
2 cups of carrot pulp left after juicing carrots (you can use winter squash as a substitute, peelit and chop very finely)
'l. cup of honey
1 cup of ground almonds
2 large cooking apples
a handful of raisins

Peel the apples, cut them into small pieces and place them into a greased baking dish. Sprinkle the raisins on top of the apples.

In a blender put the rest of the ingredients and blend well. Put the mixture on top of the apples. Smooth the top and bake at **150**°C for **40-50** minutes.

Russian custard

for one person:
2 eggyolks
%-i teaspoon of honey
multiply the ingredients for the number of people to be served.

Russian Custard can be used instead of cream on fruit or you can serve it on its own with some chopped nuts on the top or pieces of fruit. It can also be used instead of cream in making cakes. Separate the eggyolks from the whites, add the honey and whip the mixture until it goes thick and almost white. As well as being a delicious desert, it provides very good nutrition. Get your eggs from a source you trust. Free range organic eggs are the best.

Apple sauce

5-6 large cooking apples
7₂ cup butter
1-2 cups water
1-2 cups honey

Peel and core the apples, cut them into pieces and cook in a pan with the water until soft. Take off the heat and add butter. Cool down, mash and sweeten with honey.

You can make pear sauce the same way though you may not need to add honey, as pears are naturally very sweet.

This sauce will keep well in the refrigerator and can be served with some yoghurt, chopped nuts, Russian custard or on its own.

Birthday cake

Make an apple sauce from **5-6** large cooking apples and cool it down. Make it quite sweet as the pastry of the cake is not going to be sweetened. You can make a pear sauce instead of apple.

Separate yolks and whites of **6** eggs into two large bowls. Whip the yolks until thick and light in colour. Whip the whites until firm and no longer

runny. Combine the two and add 2 cups of ground almonds. Mix well. Bake in a cake tin lined with greased baking paper for **40** minutes to **1** hour at a temperature of **150**°C **(300**°F). Test with a dry knife whether it is cooked inside (the knife will come out dry if the cake is ready). Depending on the oven the baking time may vary. When ready allow the cake to cool down.

Now the fun part starts. With a long knife cut off the top of the cake making sure that this layer is no more than **1** cm thick. Put it aside for using as the top of your cake later. Using a table spoon carefully spoon out the inside of the cake in medium sized chunks into a separate dish leaving just an outside shell, which will look like a dish ready to be filled. Fill it up with layers of your apple sauce (or pear sauce), frozen raspberries, chopped nuts and chunks of cake, which you spooned out before. Here you can really improvise by using different berries, stoned cherries, pieces of soft fresh fruit, chopped nuts and seeds (sesame, poppy, and sunflower). When the "cake dish" is filled, cover it with the top layer you removed earlier. Spread the remaining apple sauce on and decorate. To decorate you can use fresh fruit, berries, nuts and desiccated coconut. After decorating is done, put the cake into the refrigerator. It is best to make this cake the day before the party so it has the time to "mature" over night.

This is the basic recipe. You can improvise by adding seeds, chopped nuts, grated carrot or pumpkin into the pastry before baking, filling it with different combinations of fruit and berries, and decorating it any way you like. Children like to be involved in decorating. Any of the decorating ingredients, which I have mentioned before, are optional depending on your family's sensitivities. These are fruit, berries, nuts, seeds, fresh mint leaves and coconut.

Ice-cream

Buy in advance some very ripe bananas (with brown spots on the skin), peal them and put in the freezer. On a day when you want to make the ice-cream, get these frozen bananas out and leave them in the room for about **30** minutes to slightly defrost. Blend them in a food processor. Add a little bit of water to make a good creamy consistency. You can blend in some fresh or frozen berries, pieces of fruit, desiccated or fresh coconut to the mixture and some coarsely chopped nuts to make different flavours.

Fresh coconut

When you are buying a coconut, make sure that the shell has no cracks or any other damage to it. Put the nut close to your ear and shake it. If the

coconut is healthy, you will hear its juice splashing inside. When a coconut is damaged and its juice has leaked out, then it will be rancid and unsuitable to eat.

When you bring your coconut home, the fun bit starts. You will need a screwdriver and a hammer. At the top of the coconut there are three round dots. Push your screwdriver through **2** of those dots to make **2** holes. Drain the juice through one of the holes allowing the air to get inside through the other hole. The juice is very nourishing and can be used in cooking or drunk as it is. It should have a fresh sweet taste. If the juice tastes rancid, then there is no point in cracking your coconut, it will be unsuitable to eat. After draining the juice crack the shell with the hammer and separate the pulp from the shell. Rinse the pulp with the water to wash off any small bits of shell. There are number of ways to eat it:

- Cut the pulp into small pieces and eat it as it is. It has a very pleasant sweet taste.
- Grind it in your food processor to make sweets (next recipe).
- Put the pulp through your juicer to produce a thick coconut cream, which can be diluted with water to make a delicious coconut milk. The cream and milk can be added to your cooking, used as a dressing for fruit and vegetable salads, as a cream for cakes or a replacement for custard.
- Mince the coconut pulp to use in your baking, home made ice-cream and other desserts, soups, stews, salads and sauces.

A word of caution for children and adults with diarrhoea. Coconut is very fibrous and may make the diarrhoea worse, so initially I suggest putting the coconut through a juicer, which would separate the fibre from the rest of it. This way you can enjoy the freshly made coconut milk and cream, getting all the good nutrition from them without the fibre.

Coconut sweets

***1** medium-size coconut*
***1** cup of dried fruit (can be any of the following: dried apricots, figs, dates or raisins, or a mixture of them. Make sure they are not sorbated or coated in starch)*
***1** cup of sesame seeds or ground almonds*

Soak the dried fruit for **6-8** hours. Drain.

Make two holes in the coconut and drain the liquid. Put the liquid through a fine sieve and reserve for the recipe.

Shell the coconut and rinse the pulp to wash away small bits of shell. Cut the coconut pulp into pieces small enough to put through your grinder or juicer.

Grind the coconut pulp with the dried fruit. Mix well in your food processor or by hand. If the mixture is too dry, add some liquid from the coconut, which you have reserved.

With your hands roll small balls from the mixture and coat them in sesame seeds or ground almonds. Place on a large plate and refrigerate.

9. Egg-free recipes

Eggs are used in baking as a binder to keep all the other ingredients together. Some children have a true allergy to eggs and have to avoid them. The following ingredients will act as a binder in your baking instead of eggs.

- Gelatine, well dissolved in a small amount of hot water;
- Pumpkin, baked and mashed;
- Butternut squash and other winter squashes (acorn, turban, hubbard, spaghetti), baked and mashed;
- Banana, mashed;
- Apple, baked and mashed or made into an apple souse;
- Pear, baked and mashed or made into a sauce;
- Zucchini (marrow or courgettes), baked, mashed and drained of excess liquid.

Egg-free hreadlcake/muffin mixture

2 cups of ground nuts (almonds, cashews, walnuts, hazels, etc.)

3 tablespoons of butter (or coconut oil, ghee, goose fat, duck fat)

2 cups of cooked and mashed squash (butternut squash, pumpkin or other less watery squashes, apple sauce, pear sauce)

To prepare the squash (pumpkin), cut it into two halves and remove the seeds. Place on a baking tray with the cut surface down and bake in the oven until very soft (a knife should go through it very easily). Cool, scoop out all the inside and mash with a fork.

You can improvise on this recipe by adding to the mixture honey, dried fruit, coarsely chopped nuts, shredded coconut, berries and fruit pieces.

Mix all the ingredients well. Put into a well-buttered baking dish and bake in the oven at **150-175**°C **(300~350**°F) for **45** minutes to an hour. Occasionally check with a dry knife if it is ready (the knife has to come out dry).

If in the same mixture you add **2** tablespoons of pure tomato puree (with a single ingredient: tomato), some salt and pepper, you can bake a pizza base. Just spread the mixture on a baking paper, shaping it with a spoon.

Experiment with your own varieties, using ingredients available to you from the allowed list. Here are a few examples of egg-free recipes you can make.

Egg free-banana muffins

2 cups of cashew nuts or any other nuts
2 ripe bananas
4 teaspoons of honey
4 teaspoons of gelatine powder or crystals
4-8 tablespoons of coconut oil or butter

Grind the nuts into a flour (you can use ground almonds instead). Mash the banana. Dissolve gelatine powder in half a cup of hot water.

Mix all the ingredients together. Fill paper muffin cases with the mixture and bake at **150-170**°C **(380**°F) for **15-20** minutes.

You can vary this recipe by folding in different berries into the mixture, small pieces of fruit, coarsely chopped nuts or seeds (sunflower, sesame or pumpkin).

Egg-free Easter Eggs

2 cups of pecans
a handful of coconut flakes
4 tablespoons of butter or ghee
2 tablespoons of honey

Blend all the ingredient in the food processor into a fine paste. With your hands roll out small eggs. Put them in the freezer until ready to eat.

With this mixture you can make different biscuits, using children's biscuit shapes. Roll the mixture on a well-buttered surface until **1** cm thick. Put it into a freezer for **2** hours or longer, take out and cut into shapes (squares, animals, tractors, etc.). You can let your children do the cutting out.

Egg-free crackers/biscuits

2 tablespoons of butter (coconut oil or duck fat/goose fat)
2 cups of ground nuts (almonds, hazels, walnuts, etc.)
2-3 tablespoons of water (or almond milk or coconut milk)

You can improvise by adding to this mixture herbs, cinnamon, paprika, cayenne pepper, black pepper, salt, grated cheddar cheese (if well tolerated) or peanut butter.

Mix the ingredients well. Roll out thinly on a board, sprinkled with some ground nuts. Cut into squares or any other shapes. Sprinkle some coarse salt, poppyseeds, caraway seeds or coriander seeds on top. Bake in the oven on well-buttered baking paper at 150°C (300°F) for 10-15 minutes.

Egg-free fruit dessert

1. Blend or cut into small pieces available berries and fruit and cover the bottom of your baking tin with the mixture. Nice combinations are plums and apples, pears and raspberries, cherries and pineapple, apple and blackcurrants.
2. Pour about 3 cups of ground almonds over the fruit.
3. Sprinkle ½ cups of shredded coconut over the almonds.
4. Spread 1-2 cups of pecan halves over the coconut (you can use any other available nuts, coarsely chopped).
5. Cover the top with 200g of butter, cut into slices (you can use coconut oil or ghee instead of butter).
6. Bake at 160-175°C (350°F) for about 40 minutes.

Egg-free apple pie

1. Fill your baking dish halfway up with peeled and chopped cooking apples and plums (take the stones out). Instead of plums you can use blackcurrants, raspberries, blackberries, pears, elderberries, etc.
2. Pour half a cup of honey over the fruit and mix lightly.
3. Soak two handfuls of dried dates in half a cup of hot water to make them softer. Drain and use for the crust. The soaking water is very sweet and can be poured over the fruit.
4. To make the crust blend the dates with 1 cup of ground almonds and 2 tablespoons of butter. With your hands shape the mixture into a bail, put it on a large sheet of baking paper or cling film and roll it out into a

round pancake shape large enough to cover the top of your baking dish. Lift up the baking paper with the rolled out pastry and carefully flip it over the fruit. Make sure that the pastry covers the whole of the fruit, trim off any excess and fill any holes with it.

5. Bake in the oven at **i3o-i50**°C **(300**°F) for about **40-50** minutes.

Egg-free cookies (biscuits)

2 cups of ground nuts (nut flour)
1 cup of cooked and mashed butternut squash
pear sauce made from 1 large pear
1 tablespoon of butter or any other acceptable fat

Mix all the ingredients well and bake small biscuits on baking paper at **150-i6o**°C **(300**°F) for about **20** minutes.

10. **Beverages**

Nut/seed milk

You can use almonds, sunflower seeds, sesame seeds, pine nuts, etc. to make milk. Almonds make the best milk. You can add a teaspoon of flaxseeds to make the milk thicker. Soak the nuts/seeds in water for **12-24** hours, drain. Blend in a food processor with water: fori cup of nuts/seeds add **2-3** cups of water. A good juicer will crush the nuts/seeds well, making a paste, which you blend with water. Mix well and strain through a cheese-cloth or a fine strainer and you have got milk. You can add some soaked dates or raisins, when blending, they will make the milk sweet. If you find that the milk is too rich, just add more water. You can add some freshly pressed apple juice or carrot juice into it to make a very tasty and nourishing drink.

Coconut milk

Bring to boil **1** cup of unsweetened shredded coconut and **1** cup of water. Cool down and blend well in the food processor. Strain through a cheese-cloth or a fine strainer.

Ginger tea

1 tablespoon of freshly grated ginger root
water

In your teapot put the grated ginger root and pour over boiling water. Cover and brew for **5-10** minutes. Pore through a sieve. It is a warming drink and aids digestion.

Freshly squeezed juices

Use only organic fruit and vegetables for making juices. Wash your fruit and vegetables and cut any bad bits off. Do not peel and do not remove seeds.

A good juice to start the day is pineapple + carrot + small amount of beetroot.

The most therapeutic juices do not taste very nice: green and vegetable juices. To make your juices tasty and enjoyable to drink I recommend making mixes of different fruit and vegetables. You can make all sorts of juice mixes, but generally try to have:

- **50%** of highly therapeutic ingredients: carrot, small amount of beetroot (no more than **5%** of the juice mixture), celery, white and red cabbage, lettuce, greens (spinach, parsley, dill, basil, fresh nettle leaves, beet tops and carrot tops),
- **50%** of some tasty ingredients to disguise the taste of therapeutic ingredients: pineapple, apple, orange, grapefruit, grapes, mango, etc.

Your patient can have these juices as they are or diluted with some water. If throughout the day your GAPS child would not drink just water, you can add some of these freshly squeezed juices into the water to make a tasty drink. Initially start with **1** cup of juice a day. With a small child you may want to start from a very small amount, like **1** teaspoon a day. Increase the daily amount very gradually until your child has **2** cups of freshly squeezed juices a day. These juices should be taken on an empty stomach, so first thing in the morning and middle of the afternoon are good times.

With these juices you can make ice-lollies. Just fill ice-lolly forms with freshly squeezed juice and freeze.

You can also make ice-cubes from these juices which can be used to make a cold drink in hot weather. Just fill the glass with these ice-cubes and add mineral water (still or carbonated).

The carrot pulp left from juicing can be used in your baking mixtures together with ground nuts or as a replacement for ground nuts. You can also use pulp left from other fruit and vegetables depending on your taste preferences.

Fruit smoothies

You can make all sorts of combinations. If you make your own goat's yoghurt, then you can use it as well. Here are a few ideas.

Blend a banana with 7₂ ripe avocado, half a cup of home-made goat's yoghurt and a bit of honey to taste.

Half an avocado blended with freshly squeezed apple/carrot juice or freshly squeezed pineapple juice.

Banana blended with freshly squeezed carrot juice (apple juice, pineapple juice, orange juice, etc.) and half a cup of yoghurt.

11. **Yoghurt and creme fraiche**

In the initial stages many GAPS patients tolerate goat's yoghurt better than cow's. So, try to make yoghurt from goat's milk first. I strongly recommend using only organic milk. A lot of milk on the supermarket shelves has been subjected to a process, called homogenisation in order to stop milk from separating in the bottle. This process breaks down the fat globules and changes the structure of milk making it harmful for the body. Try to buy milk, which apart from pasteurisation, has not been subjected to any processing.

Goat's yoghurt is quite a lot more liquid than cow's yoghurt. You can use it as a drink or if you want to thicken it you can drip it through cheesecloth.

To make yoghurt you need to introduce bacteria into the milk. You can buy commercially available yoghurt starters from many health food shops or small-holding suppliers. Alternatively you can use commercially available live yoghurt as a starter. After making their first yoghurt many people successfully perpetuate their own yoghurt by using it as a starter for the next batch. You can also keep the liquid left from dripping your yoghurt in a clean dry jar in your refrigerator to use as a starter for making the next batch of yoghurt. If at any point your own yoghurt or the "dripping liquid" do not work you need to start again with a commercial starter or commercial live yoghurt.

Instructions for making yoghurt

l. In a stainless steal pan bring close to the boil l litre of milk (goat's or cow's) stirring occasionally. You need to bring the milk close to boiling

point in order to destroy any bacteria, which may linger in the milk and interfere with the fermentation. However, do not boil the milk, as it will change its taste. Take the pan off the heat. Cover the pan with the lid and cool down by placing the pan into cold water until the temperature of the milk is around **38-45**°C. If you do not have a suitable thermometer use your own hand to determine the right temperature. To do that take a teaspoon of milk from the pan (using a clean dry spoon) and put the milk on the inside of your wrist. If it feels just slightly warm then the temperature is right.

2. If you are using a commercial yoghurt starter in a powder form you need to dissolve the powder in a little milk first before adding it to the pan. If you are using your own yoghurt or commercial live yoghurt add 7a cup into the milk. Stir well, cover with the lid and put in a warm place preferably at **38-45**°C. You can use a clean dry thermos for this purpose, a yoghurt maker, an electric plate, the top of your boiler or your airing cabinet (if it is warm enough). Ferment the yoghurt for at least **24** hours or longer.
3. After the fermentation is complete, move the yoghurt into a clean dry glass jar, cover and refrigerate.
4. To drip the yoghurt line a large colander with a cheese-cloth. Place the colander into alarge bowl and pouryour yoghurt into the lined colander. Cover with a tea towel and let it drip for a few hours. You can collect the liquid after dripping and keep it refrigerated in a dry glass jar to re-use as a starter. You can also use this liquid for soaking the liver in to remove any bitter taste before cooking it. Depending on how long you leave your yoghurt dripping you can make a soft cottage cheese or thicker yoghurt. Both soft cottage cheese and the yoghurt can be used for baking, adding to salads and soups and as desserts with honey and fruit.

Instructions for making creme fraiche

By using cream instead of milk you can make creme fraiche or soured cream. For llitre of cream use one sachet of commercial starter or l cup of live yoghurt.

1. Constantly stirring, bring the cream to boil but do not let it boil.
2. Cool down by placing the pan into cold water. Keep the pan covered at all times.

3. Test the temperature, it should be **38-45**°C.
4. Add the starter and ferment for **24** hours minimum.

This soured cream or creme fraiche is very nice to use in salads, soups, stews, in baking or as a dessert with some honey and berries. You can blend it with a little honey and frozen fruit or berries to make an instant ice-cream.

4. IT'S FEEDING TIME! OH, NO!

Grown-ups never understand anything for themselves, and it is tiresome for children to be always and forever explaining things to them.

Antoine de Saint-Exupery
he Petit Prince, 1943

It is very rare to meet a GAPS child who is not a finicky eater. The same can be said about many GAPS adults as well. This problem is particularly pronounced in autism. The majority of autistic children and adults have feeding problems, sometimes very severe. Some are very fussy and would accept only a very limited range of foods. Some cannot chew properly and would hold food in their mouth for a long time or try to swallow it in a lump. Some can only suck from a bottle and would not drink from anything else. Feeding time is a nightmare for many parents of autistic children.

There are number of possibilities why GAPS patients have these problems.

First is a distorted sensory input. The taste buds in their mouth receive the information about food, which gets passed to the brain. A GAPS brain is clogged with toxicity and cannot process this information properly. As a result, to these people the food can taste completely different to what it should taste like. Add to that a distorted feeling of food texture and temperature and we start appreciating why an autistic child, for example, would not accept many foods. The taste, texture and feeling of food can be quite offensive for them.

Second is a craving for sweet and starchy foods typical for all people with abnormal bodily flora, particularly with *Candida albicans* overgrowth. No matter how finicky a GAPS child or an adult might be, most of them would accept sugary drinks, biscuits, cakes, sweets, sugar-laden breakfast cereals, chocolates, chips, crisps, pasta and white bread. In fact these are the foods to which many GAPS people limit their diet thus feeding the vicious circle of abnormal flora and toxicity in their bodies.

Third is the state of the mouth itself. A human mouth is home for a large population of microbes which normally protect the mouth from

pathogenic bacteria, viruses and fungi, maintain the healthy state of the mucous membranes and various structures in the mouth. GAPS children and adults often have a very abnormal bacterial flora in their mouths, often with an overgrowth of *Candida* and other pathogenic microbes. The activity of this abnormal flora produces a lot of toxins, which are stored in the mucous membranes of the mouth and alter the functioning of taste buds, saliva glands and other structures. Apart from contributing to the distortion of taste, this process causes a chronic inflammation in the mucous membranes of the mouth, making it a target for the immune system. As a result of microbial activity and inflammation many GAPS patients have bad breath, very red lips and mouth, various spots and ulcers on the mucosa of the cheeks and a coated furry tongue. Many foods, like raw fruit and vegetables, herbs, uncooked nuts and seeds, cold pressed oils and some other foods have strong detoxifying substances, which would bind to the toxins in the mouth trying to remove them. This can feel far from nice ranging from stinging, itching and burning, to simply an unpleasant taste, and indeed, those are the foods that GAPS people commonly would not accept.

There are some contributory factors. For example, any secretion from the body is a way of eliminating toxins. Saliva is one of them. GAPS patients have very toxic bodies and some of these toxins get excreted through saliva. This contributes to the toxic load in the mouth, altering the taste and feel of foods.

In some cases of autism and other GAPS disorders another contributory factor comes into play - an inability of the toxic brain to orchestrate normal movements of the muscles in the mouth, tongue and other structures involved in chewing and swallowing. These are the patients who cannot chew and swallowproperly. Foods have to be very soft for them and they would vomit very often. Such severe abnormality is fairly rare, but this problem exists in many GAPS children and adults to a milder degree.

So, what are we to do with these feeding problems?

It is the appropriate nutritional management aimed at normalising bodily flora and detoxifying the person that would eventually make foods taste properly for him/her. Adults generally are not much of a problem in terms of persuading them to change their diet, though it can be difficult to get them stick to it. But how on Earth can we apply any nutritional management to a child who would not eat anything? Indeed, this is the hardest point for many parents in managing their child's condition.

I generally don't believe in hopeless situations. Where there is a will

there is a way! There is a way, a very efficient way of introducing foods into your child's diet. It requires a lot of determination from the parents but it brings a huge relief and quite a bit of normality into your family's life. This way is ABA (Applied Behaviour Analysis) or behaviour modification. The main principal of this method is based on common sense used by parents for centuries. I am sure you all recall your parents telling you "First you have to do your homework, than you can go and play!", or "If you want to go to the zoo on Saturday, you have to …" So, the formula is - if you want something, you have to work for it!

When you first introduce this method into your child's life, he or she is not going to like it, so expect a lot of resistance until your child learns the rules of the game. If you do not give up in those first difficult days, your child will understand pretty quickly that to get what he or she wants your child has to do something for you. As soon as he or she understands that, your life will become much easier. If you already are doing an ABA programme with your child at home you can make feeding a separate drill for your therapists to work on in the sessions. All you will have to do is to cook the food and bring it into the therapy room.

So, how do we apply this method to children?

Let us start from the more severe end of the spectrum - a non-verbal autistic child.

1. Introducing new foods to a child with severe language problems

Initially use preferred foods as rewards for eating the good food. Show your child the food he/she likes the most (a piece of chocolate, couple of crisps, a piece of biscuit, etc.). Put it out of his/her reach but in clear view. Offer your child one mouthful of the food you want to introduce. Ignore tantrums, screaming, crying and all other misbehaviours. Do not give him what he wants until he has had that one mouthful of the good food and do not let him leave the table. When he has had only one mouthful of the good food or literally just tasted it, give him the preferred food as a reward with lavish praise, hugs, kisses, tickles (whatever your child would most appreciate) and let him go. In a few minutes repeat the whole procedure again. Only work on one mouthful at a time, reward and let him/her go. In a few minutes repeat again. Give your child only a small amount of the reward food: one or two crisps, a little piece of chocolate, etc. If he comes back for more, get him to eat another mouthful before rewarding him with another crisp, small piece of chocolate, eta These reward foods will have to be

available only as rewards for eating the good foods, they must not be given to your child at other times, otherwise your child will wait for that time when he can get it without any effort. Keep the whole procedure positive and as happy as possible. After your child starts to take one mouthful of a particular food without any trouble, start demanding two mouthfuls of the same food for the same reward. You may spend a few days, a week or even more on the one mouthful stage, in different children it takes different effort. After you have conquered the two mouthfuls, move to three mouthfuls for the same reward. Slowly increase the number of mouthfuls until your child eats the whole meal.

The examples of reward foods, which I have given here (chocolate, crisps) are foods which are not allowed on the GAPS nutritional programme. However, in the initial stages when you are trying to teach your child the whole ABA concept use whatever works. Once your child has understood the rules of the game move to rewards allowed on the diet. If your autistic child can be motivated by any dessert ideas allowed on the diet, then - hooray! - forget about chocolate and crisps.

Apart from favourite foods you can use anything else your child likes as a reward for getting him/her to eat the new food. For example, if your child likes to watch a particular video: put that video on, let it play for 5 minutes, then pause it. Offer your child a mouthful of the food you want to introduce into his diet. Do not switch the video back on again until that mouthful is eaten. Do not give in to tantrums, screaming, crying, etc. When your child has the mouthful, give him/her a lavish enthusiastic praise with hugs and kisses and switch the video back on. In a few minutes repeat the procedure again. If your child is not particularly interested in videos, use whatever he/she is interested in - toys, books, games. Obsessive behaviours and self-stimulation generally should not be encouraged in autistic children. However, if that is the only thing that would motivate your child, use them as rewards for eating the right foods.

It is important to work on one food at a time. Do not try to introduce several foods at the same time. Decide for yourself what food is the most important to introduce first into your child's nutrition and work on it. It is sensible to start with foods which you think would be easiest for your child to accept. As you have conquered one or two foods and your child's menu starts growing you will find that introducing consecutive foods becomes easier and easier. In no time at all your child will be having a very nourishing and varied diet.

The important thing is not to get disheartened by the initial resistance

from your child, but persevere. Hundreds of parents who have implemented the ABA programme with their children had to go through the initial stage of tantrums to get their children to do anything, from simple "Come here" to more complex things. Nobody can teach a child who would not comply with anything you tell it to do. But once you have won that first battle, you have gained your child's compliance, which means that now you have a child whom you can teach!

1. Introducing new foods to GAPS children without language problems

With GAPS children who do not have problems with communication the procedure is similar but much easier. The child has to eat the good food first in order to get what he/she wants: a preferred food, a game, a toy, etc. In these children I would not use non-allowed foods, like chocolate or crisps for rewards. You can use your home-made desserts, allowed on the diet. I am sure that most parents are familiar with the timeless mother's motto: Have your meal first, then you will get your pudding! Apart from that, use more sophisticated rewards as games, toys, trips to cinema, etc. rather than food rewards.

Just like with autistic children, with other GAPS children it is important to start from small achievable targets, like one mouthful or a small piece of the food. If you try to suddenly introduce a large plateful of food, which your child hates, you are going to fail. Once your child will accept a small piece for a reward, slowly move to larger and larger portions. Be patient and consistent! Do not give in to whining, complaining or tantrums! If he/she does not eat the good food - he/she does not get the pudding (or any other reward)! As simple as that! You have to be firm. Once you have asked your child to have the one mouthful of food you cannot back off or allow any negotiations or manipulations. If you allow your child to win on the food issue, you have lost on many other issues!

If your child refused the one mouthful of the good food and does not seem to care that he/she did not get the reward, it means that you have chosen the wrong reward! Choose a reward which your child cares about strongly enough that he/she would do anything to get it. However, no matter how motivating the reward is never forget to add to it your lavish enthusiastic praise with a hug! Your child has to feel that he/she has done something really good when they had that mouthful of the good food!

In the majority of cases once the children have had a good taste of a food which they did not touch before they actually start liking it. As their bodily

flora starts to improve, a lot of cravings go away and the normal sense of taste returns, so your child will start developing a new liking for different foods. But to start this process off your child needs your help. On his/her own your child is not capable of braking the vicious cycle of cravings, toxicity and abnormalities in taste. Once your child has a good balanced diet, you can allow him/her not to eat a small number of foods which they particularly dislike. We all have these likes and dislikes. However, make sure that it is within normal proportions,

It is very important to keep the whole process positive! Talk to your child, explain why you want him or her to eat this food, what good it will do in their bodies. Try to talk on this subject at every meal time using language and phraseology on your child's level making it fun, a game and a laugh. And when your child complies do not put any limits on your praise or expression of delight! Let your child really feel how happy he or she has made you by eating the good food! Your enthusiasm combined with the reward, given at the same time, will make this experience for your child something to look foreword to, to anticipate with pleasure at the next meal time.

In conclusion I would say that about **60-70%** of parents who come to see me with their children say up front that any idea of introducing any diet into their child's life is impossible! "My child will not eat it!" However, having implemented the ABA principles, which I have described here, most of these parents soon forget just how fussy with food their child used to be. Sitting down to a meal with your family becomes a normal and pleasurable procedure, as it is supposed to be!

SUPPLEMENTATION FOR CHILDREN AND ADULTS WITH GAP SYNDROME

We all love our small or grown up children very much and we are prepared to do our best for them, no matter how difficult or expensive it might be. That makes us vulnerable to try anything and everything in the hope that it will help our children. I meet family after family who give their child **10,15, 20** or more of various nutritional supplements without any idea if any of them are doing any good. Nutritional supplements are expensive and the market is full of hundreds of various brands. Many of them have questionable quality and the whole industry is not regulated very well.

I cannot emphasise enough that an appropriate diet has to be the number one intervention in successful nutritional management of the GAPS child or adult. No pill in the world is going to come close to the effect of the diet on your patient's condition. When it comes to digestive disorders in particular, and GAP Syndrome is essentially a digestive disorder, we have to be very careful what we introduce into the gut of the patient. Why? Because a lot of supplements may irritate an already inflamed and damaged gut lining and interfere with the healing process. You do not want to put a lot of effort into implementing the diet and then spoil the whole process by a pill.

However, some supplements can be very beneficial and some are essential. The supplementation protocol has to be very individual and ideally should be worked out by a qualified practitioner. Here we are going to concentrate on absolute essentials. A majority of my patients progress very well with the use of diet and these essential supplements without adding anything else.

The essential supplements for GAPS patients:

1. An effective therapeutic strength probiotic.
2. Essential fatty acids.
3. VitaminA.
4. Digestive enzymes.
5. Vitamin and mineral supplements.

Let us have a good look at each of these supplements.

1. PROBIOTICS

Probiotics are the beneficial bacteria in the form of a nutritional supplement of fermented food, which can be taken in an attempt to replace or supplement damaged indigenous flora. Contrary to antibiotic meaning "against life" probiotic means "pro-life" or "for-life"

The use of probiotic bacteria in the form of fermented foods goes back to pre-Christian times. For thousands of years people fermented milk, fruit and vegetables, beans, fish, meats and cereals. Fermenting food improves its taste, makes food more digestible and preserves it. Today many cultures around the world routinely consume beneficial bacteria in fermented foods: sauerkraut - fermented cabbage (Russia, Germany and Eastern Europe), table olives and salami or fermented meat (Mediterranean countries), keffir (Russia), mazun (Armenia), kumiss (Russia and Asia), lassi (India), Gioddu (Sardinia), yoghurt and cheese (all over the world), fermented fish (Korea, Sweden, Japan, Russia), fermented grains (Africa) and fermented soybeans (Asia),

A Russian scientist Ilia Metchnikoff at the beginning of the 20th century put the subject of probiotics on a scientific basis. Working at the Pasteur Institute in Paris Metchnikoff noticed that country people in Bulgaria regularly consumed fermented milk products and lived to an unusually great age in good health. He isolated a bacterium, which he called "Bulgarian bacillus" and used it in his scientific trials. Now this bacterium is known as *Lactobacillus bulgaricus* and is widely used in yoghurt production. Following his discovery the use of *Lactobacillus bulgaricus* as a health supplement became very popular in European countries. When antibiotics came along the probiotics were largely forgotten. However, after Metchnikoff's death in 1916 his research was continued in various countries around the world. In Russia, Scandinavia and Japan probiotic bacteria have been in use as a treatment for humans for decades. In the West the probiotics were used mainly in farm animal feed and a lot of scientific data has been collected about their health-giving properties for the animals. In the last couple of decades the use of probiotics for humans has become

popular again and we have started to see more and more scientific publications on this subject. The scope of disorders where probiotics have been successfully used as part of treatment is rapidly growing.

Naturally the biggest use of probiotics we have seen is in the treatment of gastro-intestinal disorders:

- viral infections of the digestive tract
- necrotising enterocolitis in infants
- intractable paediatric diarrhoea
- pseudomembranous colitis
- traveller's diarrhoea
- *Clostridium Difficile* enterocolitis
- *Helicobacter* infection
- enteropathogenic Ecolnnfection
- inflammatory bowel disorders: Crohn's disease, ulcerative colitis and chronic pouchitis
- irritable bowel syndrome
- lactose intolerance
- prevention of colonic cancer in laboratory studies

In many cases adding probiotics to the treatment regimen not only improved the clinical picture but also cured the condition.

Apart from digestive problems many other health problems have been shown to respond to treatment with probiotics:

- allergies including food allergy
- autism
- chronic viral infections
- urogenital infections
- hepatitis, liver cirrhosis and biliary disease
- tuberculosis
- meningitis
- malignancy
- arthritis
- diabetes
- burns of various degree
- perioperative care and intensive care in surgical patients and patients with massive blood loss
- clinical infections
- autoimmune disorders

These are only the conditions about which scientific papers have been published. But, if you talk to any doctor or practitioner with experience in using probiotics, this list becomes much longer.

So, what bacteria do we consider to be probiotic?

1, *LactobacilliThis* is a large family of bacteria, which produce lactic acid - hence their name. Most commonly known members of this family are *L. acidophilus, L. bulgaricus, L. rhamnosus, L. plantarum, L. salivarius, L. reuteri, L. johnsonii, L. casei*
and essential inhabitants of the human gut, mucous membranes of the mouth, throat, nose and upper respiratory tract, vagina and genital area. They are found in large numbers in human breast milk. *Lactobacilli* get established in the body of a new-born baby in the first few days and form a complex relationship with the host for the rest of his/her life. By producing lactic acid they maintain acidic environment (pH - **5.5-5.6)** on mucous membranes, which suppresses the growth of pathogenic microbes. Apart from lactic acid they produce a plethora of active substances: hydrogen peroxide - a powerful antiseptic; anti-bacterial, anti-viral and anti-fungal agents, which do not allow pathogens to get a hold in the gut. *Lactobacilli* engage immune system and stimulate activity of neutrophils, macrophages, synthesis of immuno-globulins, alpha and beta interferons, interleukin-i and tumour necrosis factor. They are involved in orchestrating the cell renewal process in the gut, keeping the gut lining healthy and intact. They are the most numerous inhabitants of the stomach and intestines and the main protecting agents in those parts of the digestive system. *Lactobacilli were* the first probiotic bacteria to be studied and to be used as a supplement to benefit health. Indeed *Lactobacilli* are the most common bacteria in commercially available probiotics today,

a. *Bifidobacteria* Most commonly known species are *B. bifidum, B. breve, B. longum and B. infantis,* though there are around **30** different species identified. This is a large family of probiotic bacteria, which are most numerous in the human bowel, lower intestines, vagina and genital area. **90-98%** of all bacteria living in the bowel of a healthy baby are *Bifidobacteria.* In an adult gut they are about seven times more numerous than *Lactobacilli* and fulfil many useful functions. Apart from producing different antibiotic-like substances which protect the gut from pathogens, engaging the immune system, maintaining gut integrity and health, they act as a source of nourishment for the body. *Bifidobacteria*

actively synthesise amino acids, proteins, organic acids, vitamin K, pantothenic acid, vitamin Bi (thiamin), Vitamin **B2** (riboflavin), vitamin **B3** (niacin), folic acid, vitamin **B6** (pyridoxine), vitamin **B12** (cobalamin), assist absorption of Ca, iron and vitamin D. *Bifidobacteria* are the second most numerous family of bacteria in probiotic supplements available on the market.

3. *Saccharomyces boulardii* This is a yeast first discovered by a French scientist H Boulard in **1920.** He observed that people in China treated diarrhoea with an extract from lychee fruit. He found the yeast in this extract which was named *Saccharomyces boulardii.* Supplementing this yeast has been found to be effective in treating various forms of diarrhoea in children and adults. Recently there has been a lot of interest in using *S. boulardii* as an antagonist to a pathogenic yeast - *Candida albicans.*
4. *Escherichia coli* or *E. coli E. coli* is a large family of bacteria. Pathogenic members of this family can cause serious infections. However, physiological strains of *E. coli* are normal and numerous inhabitants of healthy human gut. They normally occupy particular areas of the digestive system: the bowel and lower parts of the intestines and should not be found anywhere else. If they are found in the mouth, stomach or duodenum that indicates an abnormality in gut ecology - gut dysbiosis. Physiological strains of *E. coli* fulfil a number of beneficial functions in the body: they digest lactose, produce vitamins (vitamin K and group B) and amino acids, produce antibiotic-like substances, called colicins and have a powerful stimulating influence on local and systemic immunity. They are very active against various pathogenic microbes including pathogenic members of their own family. Indeed having your gut populated by physiological strains of *E. coli* is the best insurance not to succumb to pathogenic strains of *E. coli.* That is what a German physician Alfred Nissle found in **1917** when he was trying to find out why some soldiers in the First World War did not fall prey to typhoid, when most of their comrades were ill. He identified a particular strain of *E. coliin* the stools ofthese soldiers, which was named the Nissle strain. He grew this bacterium and sealed it in gelatine capsules. After trying this product on himself he started manufacturing it under the name Mutaflor. Mutaflor is still available on the market. Some other physiological strains of *E. coli* have been studied and are used in some commercial probiotic formulas around the world.
5. *Enterococcus Faecium* or *Streptococcus faecalis* As the name would imply these bacteria, as with all other probiotics, were isolated from

human stools. They normally live in the bowel where they control pathogens by producing hydrogen peroxide and reducing pH to **5.5.** They break down proteins and ferment carbohydrates. There are a number of clinical studies showing that they are effective in treating various forms of diarrhoea. These bacteria are quite common in probiotic formulas on the market.

6. *Bacillus subtilis* or soil bacteria *Bacillus Subtilis* was first discovered by German microbiologists during the Second World War, which led to the use of this micro-organism in protecting German troops from dysentery and typhoid. After the war *Bacillus subtilis* was extensively studied in Germany, Russia, Italy, Finland, Eastern Europe, China and Vietnam. Number of subspecies were identified: *B. licheniformis, B, cereus, B. brevis, B. mesentericus, B, pumilis,* etc., most of which were shown to be therapeutic in animals and then humans. This led to the development of a range of products with *B. subtilis* for animal use. For humans there are number of products with *B. subtilis* which have been used by doctors in Russia, Germany, Italy, Eastern Europe, Japan, Vietnam and China for decades. *B. subtilis* is a spore-forming microbe and is resistant to stomach acid, most antibiotics, temperature changes and other influences. It has strong immune-stimulating properties and is considered particularly effective with allergies and autoimmune disorders. It produces a whole host of digestive enzymes, anti-viral, anti-fungal, anti-bacterial and other active substances. Soil bacteria are not indigenous to humans, they are transitional microbes, which do not colonise the gut but go through it doing a lot of work on the way. We humans used to consume soil bacteria in large amounts when we were drinking water from wells and streams. In the process of evolution the human gut has developed a need for these transitional bacteria. One possible need is keeping the gut clean. *B. subtilis* species are used in waste management because they have a great ability to break down rotting matter and to suppress putrefactive microbes. By clearing out old putrefaction in the gut soil bacteria may lay the ground for re-establishment of normal gut flora. In my experience probiotics, which contain soil bacteria are the most effective probiotics on the market.

The market offers a wide range of probiotic products from probiotic drinks to powder, tablet and capsule forms. Unfortunately, many of them are not strong enough or do not contain strong enough species of bacteria to be of therapeutic benefit. There is also a problem of quality

control. The last "Which" magazine report showed that many brands of probiotics on the market do not have bacterial species listed on the label or do not have claimed bacterial strength. So, how do we choose a good probiotic?

First of all it always makes sense to work with a qualified practitioner with experience in using probiotics who will help you to chose good-quality supplements. If you are trying to chose a probiotic yourself, then there are some general guidelines to follow.

1. A good probiotic should have as many different species of beneficial bacteria as possible. A human gut contains hundreds of known species of different bacteria. We should try to get as close to that as we can. Different species of probiotic bacteria have different strengths and weaknesses. If we have a mixture of them then we have a better chance of deriving maximum benefit.
2. A mixture of strains from different groups of probiotic bacteria is more beneficial than just one group. For example, many probiotics on the market contain just *Lactobacilli.* A combination of representatives from the three main groups: *Lactobacilli, Bifidobacteria* and soil bacteria usually works best.
3. A good probiotic should have a concentrated amount of bacteria: at least 8 billion of bacterial cells per gram. You need to provide probiotic bacteria in large enough doses to see an improvement.
4. The manufacturer of the probiotic should test every batch for strength and bacterial composition and should be prepared to publish the results of testing.

Once you have found a good probiotic you need to know how to use it. A good therapeutic strength probiotic will always produce a so-called "die-off reaction". What is it? As you introduce probiotic bacteria into a digestive system, they start destroying pathogenic bacteria, viruses and fungi. When these pathogens die they release toxins. These are the toxins, which made your patient autistic or schizophrenic or hyperactive. So, whatever characteristic symptoms the patient has may temporarily get worse. Your patient may also feel more tired than usual, generally "off colour" or develop a skin rash. It is a temporary reaction and usually lasts from a few days to a few weeks in different individuals. To make this reaction as mild as possible, build the dose of your probiotic slowly. Start from a very small amount. Observe the patient for any "die-off" symptoms. If there are none then

increase the dose. When you see a reaction, let your patient settle on this dose until the "die-off" symptoms disappear. Then increase the dose again and let the patient settle on it. Keep on increasing the dose until a therapeutic level is reached. This period of building up the dose can take from a few weeks to a few months in different patients. It is very individual and depends on how much overgrowth of pathogenic microbes the person has in the gut.

The therapeutic dose level of probiotic is individual and your health practitioner should be able to help you with that. Here are general guidelines;

An adult should have around **15-20** billion of bacterial cells per day.
An infant up to **12** months of age can have **1-2** billion of bacterial cells per day.
A toddler from **1** to **2** years of age can have **2-4** billion of bacterial cells per day.
A child from **2** to **4years** of age can handle **4-8** billion of bacterial cells per day.
A child from **4** to **10** years of age can have **8-12** billion of bacterial cells per day.
From the age of **12** to **16** we can increase the dose to **12-15** billion per day.

Once die patient has reached the therapeutic dose level it should be maintained for around six months on average. It takes at least this length of time to remove the pathogenic flora and start re-establishing normal gut flora. Adhering to the diet is absolutely essential in this period. If you carry on feeding your pathogens in the gut with sugar and processed carbohydrates then the probiotic will not have much chance of helping you.

After the therapeutic period is over the dose of the probiotic can be reduced to a maintenance dose level, which the patient has to adhere to for many years. It is important to reduce the dose as gradually as you have been increasing it. Observe any reactions in this period. The maintenance dose is very individual. Usually it is half of the therapeutic dose. In some cases the patient's maintenance dose is the same as the therapeutic.

A lot of patients ask: Why do we have to have the maintenance dose? In other words why do we have to carry on taking the probiotic?
this: we have been designed by Nature to have these bacteria every day with every mouthful of food or drink. We have changed our environment, water and food to such a degree that we are depriving our bodies of these vital bacteria. For people who have good, healdiy resident gut flora it may not present a big problem. However, for patients with GAP Syndrome it is a

big problem. For GAPS people it is particularly vital to consume probiotic bacteria every day of their lives, because they do not possess their own. Their gut got populated by pathogens instead of beneficial bacteria and these pathogens are extremely difficult to drive out because they occupy different niches in the gut. To get into any of those niches the beneficial bacteria have to fight quite a battle. In fact probably the only time in our lives we have to populate our gut with beneficial bacteria is at birth, when the gut is sterile. Unfortunately most supplemental probiotics do not settle or colonise on the gut wall. They do their work in the lumen of the gut and then come out of the system. We have not yet found a way to replace the pathogens on the gut wall with beneficial bacteria. So, patients with GAP syndrome need to carry on taking probiotic indefinitely. To maintain the probiotic you do not have to carry on taking commercial preparations. You can supplement your diet with fermented foods in the form or home-made yoghurt, keffir, sauerkraut and other home-made fermented foods.

One of the concerns about probiotic bacteria is that many of them do not survive the stomach acid. Patients with GAP Syndrome usually have low stomach acidity, so this is not a big problem for them. But to make sure that your probiotic survives the stomach acid the general rule is to take it with food or after food, whenmost stomach acidis bound to foodparticles. Some manufacturers put an enteric coating on their probiotic capsules to protect them from stomach acid. I do not support this practice for two reasons. First, the stomach needs probiotic bacteria just as much as any other part of your ..digestive system. In a stomach with low acidity all sorts of pathogens grow on the stomach walls. We need probiotics to deal with these pathogens. Second, patients with digestive abnormalities are often not able to break down the enteric coating on capsules. These capsules go in and out almost unchanged without doing any good.

Perhaps not all bacterial species in your probiotic will survive the stomach acid. But, an important point to make here is that even dead the probiotic bacteria will do a lot of good in your gut. Their cell walls contain substances to stimulate immune response and they will also absorb toxins removing them from the body. A lot of food manufacturers have picked up on this fact and are planning to start adding dead probiotic bacteria into various foods.

In conclusion, probiotic supplementation is absolutely vital for treating any of the GAPS conditions. Even in those cases, where the patient does not present with severe digestive problems I find that with the use of diet and probiotics a considerable improvement can be achieved.

2. FATS: THE GOOD AND THE BAD

The human brain is about **60%** fat (dry weight). Eveiy membrane of every cell and every organelle inside of cells are made of fats. Many hormones, neurotransmitters and other active substances in the body are made of fats. Fats are extremely important in our diet. The question is - what fats?

There has been a great deal of conflicting information and misinformation about fats. In our modern society fats have been pronounced as evil and the food industry has sprung up to produce an abundance of low-fat and no-fat products. Saturated animal fats, including those in meat, butter and eggs have been blamed for all sorts of ills, so the industry, again, has been quick to provide us with synthetic substitutes, butter replacements and spreads. People heard that vegetable oils are better for you, so a variety of different vegetable oils have become the cooking oils instead of traditionally used lard, goose fat and pork dripping. What the public does not know is how all these processed oils and fats are made and what exactly they contain.

Hydrogenation and trans-fats

Margarines, butter replacements, "spreadable" vegetable oils, shortenings and many other artificial fats are hydrogenated to increase their shelf-life and to make them the right consistency. You can find hydrogenated oils in most processed foods: chocolates, ice-cream, biscuits, cakes, breads and pastries, pre-prepared meals, crisps, snacks, etc. Hydrogenation is a process of adding hydrogen molecules to the chemical structure of oils under high pressure at a very high temperature **(i2O-2io**°C or **248-4ioo**°F) in the presence of nickel, aluminium and sometimes other heavy metals. Remnants of these metals stay in the hydrogenated oils. Nickel and aluminium are both heavy metals, adding to the general toxic load which the body has to work hard to get rid of. Heavy metals, particularly aluminium, have been linked to many degenerative conditions, including Alzheimer's disease and dementia.

But that is not the main problem with hydrogenated fats. Hydrogenation changes the chemical structure of the natural oils producing a whole host of very harmful fats. Many of these changed fats have not even been studied yet and we don't know what havoc they can wreck in the body. But a group, called trans-fats, have received a great deal of attention. These are unsaturated fatty acid, very beneficial for us in a natural state, whose chemical structure has been changed through processing. Trans-fatty acids are very similar in their structure to their natural counterparts, but they are somewhat "back to front". Because of their similarity they occupy the place of essential fats in the body while being unable to do their job making cells in a way disabled. All organs and tissues in the body get affected. For example, trans-fats have great immune-suppressing ability playing a detrimental role in many different functions of the immune system. They have been implicated in diabetes, atherosclerosis, cancer, neurological and psychiatric conditions. They interfere with pregnancy and conception, normal production of hormones, the ability of insulin to respond to glucose, the ability of enzymes and other active substances to do their jobs and have damaging effects on liver and kidneys. A breast-feeding mother would have trans-fats in her milk fairly quickly after ingesting a helping of a "healthy" butter replacement. A baby's brain has a very high percent of unsaturated fatty acids; trans-fats would replace them and interfere with the brain development. It is estimated that an average intake of trans-fatty acids in the western diet is **9-12** g a day, twice as much as our consumption of the rest of unnatural substances in foods. Given their ability to impair bodilyfunctions on the most basic biochemical levels, there is no doubt that their role in our modern epidemics of degenerative disease is greatly underestimated.

Cooking oils have very high levels of trans-fatty acids, because in the process of extracting these oils from seeds very high temperatures, pressure and various chemicals have been employed. Of course, anything cooked with these oils will also contain plenty of trans-fatty acids: crisps, snacks, chips, fish and chips and all fried foods. It goes without saying that GAPS children and adults should not have hydrogenated oils or trans-fats in any form or shape in their diet.

On a chemical level all fats are made from a molecule of glycerine and molecules of fatty acids. As glycerine is the same in every fat molecule, it is the structure of fatty acids that is responsible for various functions of different fats in the body: from building hormones, neurotransmitters, cell

membranes and nervous tissue to being the best source of energy. Many fatty acids our bodies can make themselves, but there is a group of fatty acids, which our bodies cannot make. These are the essential fatty acids.

Essential fats

Essential means - we cannot live without them. Essential fats contain fatty acids, which our human bodies cannot make, so we have to get them from food. These are omega**-3** and omega**-6** fatty acids. Every cell in the body depends on them for proper function and survival. These oils take part in a myriad of functions in the body on the most basic level. Our bodies, the brain in particular, are to a degree made up of them. Hundreds of clinical studies have been performed with the use of omega**-3** and omega**-6** oils, where they were shown to be effective in treating every health condition under the sun, including autism, ADHD, dyslexia, dyspraxia, diabetes, depression, obsessive-compulsive disorder, schizophrenia, infections, cancer and so on. Due to food processing most of us don't get enough essential fats in our diets. Because of impaired digestion, there is no doubt that GAPS people are deficient in essential fatty acids and absolutely must have them added to their diet. Let us have a look at this subject in detail.

There are two essential fatty acids, from which the body can make all others:

omega**-3:** Alpha-LinolenicAcid or LNAfor short and
omega**-6:** LinoleicAcid or LA for short.
Both these fatty acids come from seeds and nuts.

The richest sources of LNA (omega**-3}** are flaxseed oil (linseed oil), hemp oil and some exotic oils from kukui (candlenut) and chia. In smaller amounts this fatty acid is present in walnuts, soybeans, pumpkin seeds, canola/rape, rice bran, dark green leafy vegetables, egg yolk, animal fats (particularly wild), animal milk and, of course, in human breast milk.

The richest sources of LA (omega**-6)** are evening primrose oil, safflower, sunflower, walnut, hemp oil and pretty much all seeds and nuts. In smaller amounts it is found in egg yolks, milk and human breast milk.

LNA and IA are called "the parent fatty acids". From these two fatty acids the body can make other fats to be used in pretty much every function in every cell (FIG. 5).

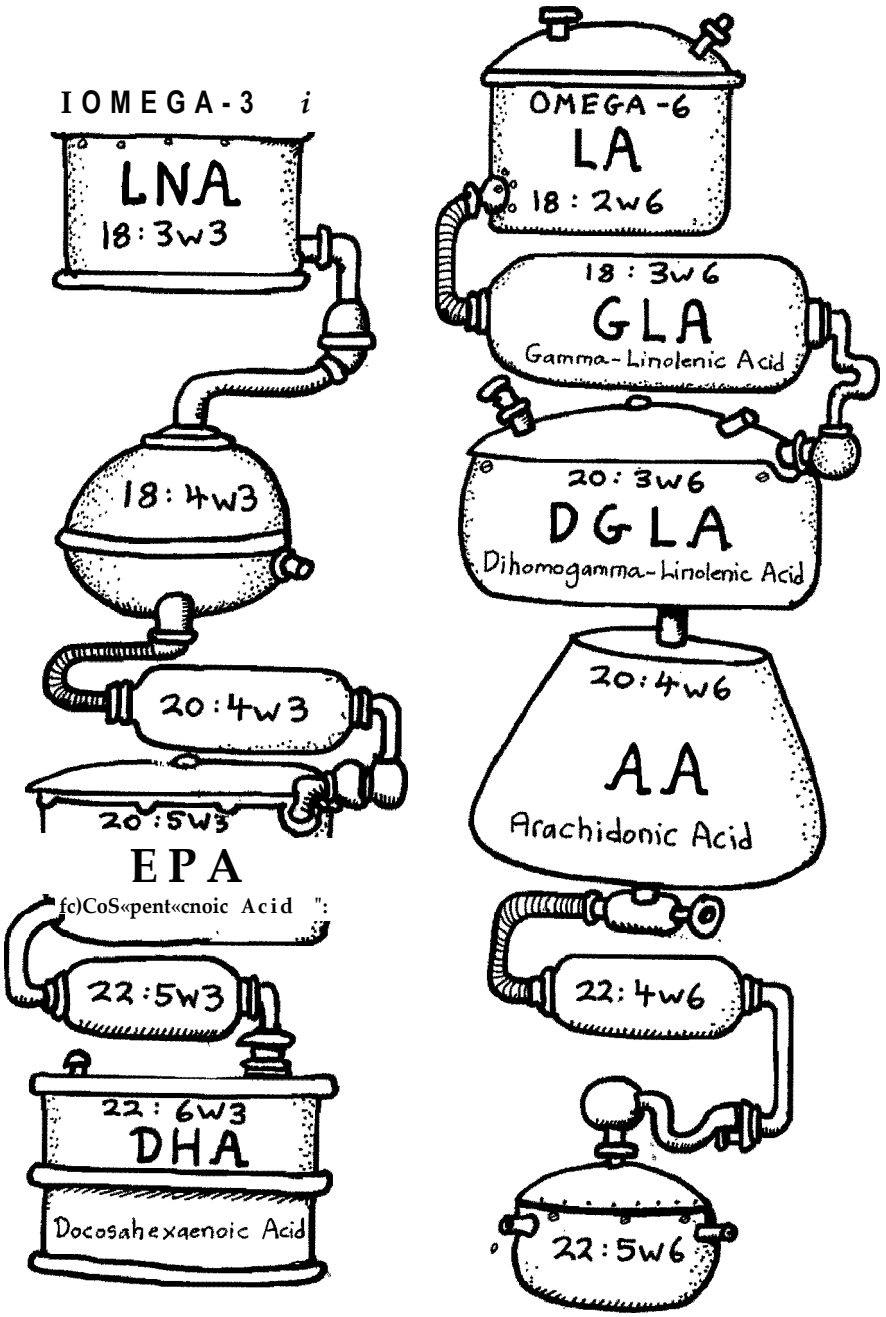

FIG. 5 **Conversion of parent omega fatty acids (LNA and LA) into various derivatives in the body.**

Omega-3 fats

From LNA (Alpha-Linolenic Acid) two very important omega-3 fatty acids are formed: EPA (Eicosapentaenoic Acid) and DHA (Docosahexaenoic Acid). EPA and DHA are absolutely vital for normal brain and eye development. They are found in abundance in brain cells, nerve synapses, visual receptors, adrenal and sex glands. However, to make them from LNA the body needs a good supply of certain nutrients: vitamins C, B3 and B6, magnesium, zinc and some enzymes. GAPS patients are almost routinely deficient in these nutrients, so it is not difficult to predict that their bodies will not be able to convert parent omega-3 (LNA), from flax oil for example, into EPA and DHA, so much needed by their brains. Some researchers in the field believe that this inability to convert the parent omega-3 LNA to brain-building omega-3 EPA and DFIA in GAPS children and adults plays a big part in their problems (FIG. 6). So, just supplementing LNA as a flax seed oil is not enough for these patients, they need EPA and DHA ready-made. The best sources of these two oils are cold water fish: salmon, sardines, mackerel, trout and eel. The oil from these fish can be found as supplements. Sea and freshwater algae and phytoplankton are very rich in these oils as well, that is where the cold water fish get their supply of omega-3 fats. Supplementing algae would have been a good way of getting these fats, however, the unpleasant taste of algae is a big problem, particularly with children. Smaller amounts of EPA and DHA are found in seal fat, whale blubber, pike, carp, herring and haddock. Cod liver oil is a good source of DHA and EPA and one of the oldest ways of supplementing these essential fats. But apart from that it is a good source of natural vitamins A and D. Despite concerns about water pollution and quality control in different brands of cod liver oil again and again it has been shown to be most beneficial for GAPS children and adults. What about just eating fish? Eating fresh fish a few times a week is the best way of getting EPA and DHA for healthy individuals. However, for GAPS children and adults that is not enough due to their inability to digest foods properly and an overload of toxins, coming from the gut, which reduce amounts of essential fatty acids in the brain. GAPS people do need supplementing with EPA and DHA in the form of cod liver oil and other fish oils.

Most fish oils, including cod liver oil, contain roughly equal amounts of EPA and DHA. However, there is evidence to show that GAPS children and adults need more EPA than DHA In the body DHA can be made from EPA. A British psychiatrist Dr Basant Puri has described a patient with severe

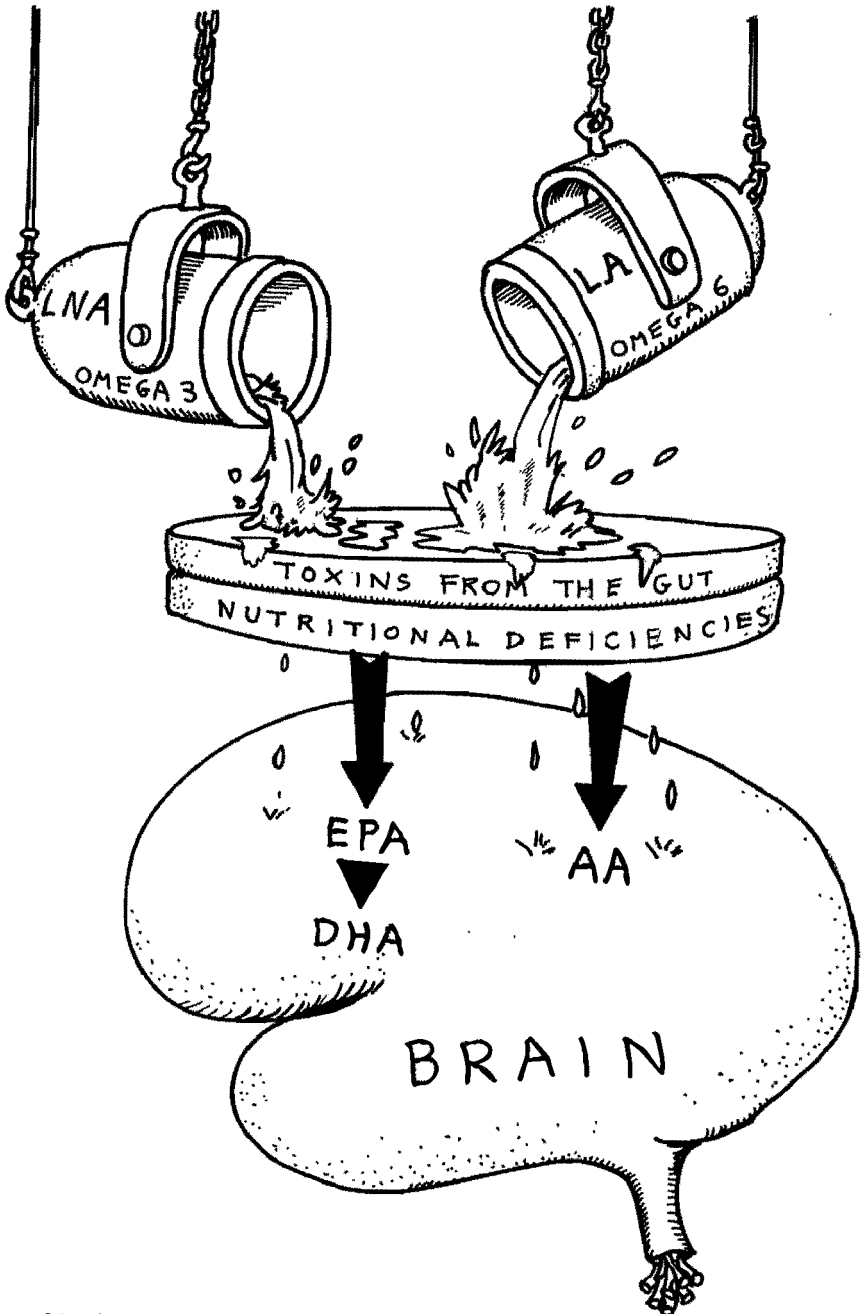

FIG. 6 Nutritional deficiencies and various toxins impair conversion of parent omega fats into derivatives vital for the body (EPA, DHA, AA and others).

drug resistant depression who completely recovered after supplementation with EPA rich fish oil. But the most astonishing result was seen on this patient's MRI scans of the brain. Before treatment with EPA this patient showed a typical for depression reduction in the thickness of the grey matter in the brain. After nine months on EPA his grey matter was restored to normal thickness. David Horrobin describes a similar example with a schizophrenic patient where, apart from dramatic clinical improvement, restoration of the brain tissue was seen on MRI scans. There are supplements on the market now with a higher ratio of EPA to DHA and many patients report good effect from these oils. DHA is considered to be essential for building the brain structure, where EPA is considered more important for the functioning of the brain. Both need supplementing in order to help GAPS patients.

Omega - 6 fats

LA (Linoleic acid) is a parent fatty acid for GLA (Gamma-Linolenic Acid), DGLA (Dihomogamma-Linolenic Acid) and AA (Arachidonic Acid). These fatty acids are essential for the immune system, hormone metabolism, inflammation, blood clotting and many other functions in the body. Many seeds and nuts contain these oils. lust as with omega**-3** oils, to convert LA into GLA and DGLA the body needs magnesium, zinc, vitamins **B3, B6** and C, so this conversion will also be a problem for GAPS patients, which means that GLA has to be supplemented as well as LA. GLA is found in evening primrose oil **(9%),** borage oil **(24%),** blackcurrant seed oil **(18%)** and hemp oil **(2%).** Many omega**-6** oils can be very efficiently supplied through regular consumption of nuts (walnuts, hazelnuts, pecans, pine, Brazil nuts, etc.) and seeds (sunflower, sesame and pumpkin). Hemp oil, evening primrose oil, unrefined sunflower oil, borage oil and safflower oil are concentrated sources of omega**-6** fatty acids, available on the market.

One omega**-6** fatty acid deserves particular attention as far as the GAPS conditions are concerned, Arachidonic Acid (AA), which makes up **12%** of all brain fat. It is by far the most abundant fatty acid in the brain. Research shows that patients with autism, schizophrenia, bipolar disorder and depression have low levels of AA in their bodies. What is happening in these patients is that AA and other fatty acids leak out of the cell membranes, where they are naturally located. This deficiency in AA means that any function, no matter how small or large cannot be accomplished efficiently between the brain cells, immune cells and other cells in the body.

Why are GAPS patients loosing AA and other fatty acids from their cell membranes? The reason is not yet clear. However, a lot of research points in the direction of an enzyme, called Phospholipase A2 or PLA2, whose function is to release AA from the cell membranes. In GAPS patients this enzyme is overactive, leaching AA from brain cells leaving them deficient in this vital fatty acid. There are a number of things which can cause PIA2 overactivity. Bio-toxins coming from bacteria, viruses, fungi and parasites in the gut are usually the major cause. Chronic inflammation in the body activates PLA2 and we know that GAPS patients have chronic inflammation in their digestive systems. Exposure to heavy metals, pesticides and other chemicals is known to cause PLA2 overactivity. High levels of insulin, caused by the consumption of processed carbohydrates and sugars, is also a strong stimulant for PLA2 activity. Cutting out grains, starch and sugar will help to preserve a lot of essential fats in the brain of a GAPS patient. Aspartame, heparin, snake and bee venom, brain injury and lack of oxygen can induce PLA2 overactivity. Due to this enzyme GAPS patients actively lose AA and other essential fatty acids from their brains and other tissues in the body. That is why it is vital to supplement them in large amounts. We have talked about LA, LNA, EPA, DHA, GLA and their dietary sources. Where do we get AA from? Here is the surprise: AA comes from meat, eggs and dairy products. You can not find it anywhere else! The GAPS diet is rich in these foods and provides large amounts of AA, so vital for GAPS patients to have. At the same time the GAPS diet cuts out the foods which cause the loss of AA and other fatty acids from cell membranes-processed carbohydrates and sugar.

We need both omega-3 and omega-6 oils. However, due to wide consumption of sunflower oil, which is quite rich in omega-6, people generally get more omega-6 than omega-3 oils in their diets, which may predispose them to various inflammatory diseases. Clinical experience shows that for people with health problems it is important to have more omega-3 oils than omega-6 in their diet. The ideal ratio is disputed as it is probably very individual, but generally it is accepted that 2:1 of omega-3:omega-6 is the correct ratio in oil blends. For GAPS people it is vital to have not only parent essential oils (LNA and LA) but their derivatives as well (EPA, DHA and GLA). That is why it is important to supply not only seed and nut oils, but fish oils as well.

There are good blends of seed/nut oils available on the market, where flax oil is the main source of parent omega-3 LNA and evening primrose oil is the main source of omega-6 LA and GLA. Look for the brands with twice

more of omega-3 fatty acids than omega-6. As long as the 2:1 ratio of omega-3:omega-6 is adhered to, you normally cannot overdose on these oils. In fact the higher the dose the more health benefits are seen in the clinical practice. Look for high-quality blended oils which have not been refined, deodorised or adulterated in any way. Heat, light and oxygen destroy seed/nut oils very quickly, so theyhave to be supplied in dark glass bottles and refrigerated at all times. Never use them for cooking. They can be mixed with cold or warm food to give to the GAPS child or adult.

Apart from the seed/nut oil blends make sure that you supplement EPA and DHA through good quality cod liver oil and fish oil. These oils are also highly perishable and should be refrigerated and protected from light and oxygen.

To summarise on supplementation of fats

GAPS children and adults should have a group of essential oils supplemented:

1. A **good seed/nut oil blend** in the ratio of **2:1** of omega-3:omega-6 fatty acids. It will supply the parent omega-3 and omega-6 fatty acids. Make sure that the oil is high quality, in dark glass and refrigerated. Depending on the age of the child start from a very small amount (a few drops added to the cold/warm food) and slowly build the dose up to **1-3** tablespoons a day. For children under the age of **18** months **1-2** teaspoons a day are usually enough. For GAPS adults start from a teaspoon a day and slowly increase to **4-5** tablespoons a day. I recommend introducing these oils gradually to avoid any reactions, which are possible in individuals with severe fatty acids deficiency.
2. **Cod liver oil,** which will supply EPA, DHA, vitamin A and vitamin D. Depending on the age of the child give **1-2** teaspoons a day. For children under the age of **18** months half a teaspoon is usually enough. It is sensible to start from a small amount and slowly build up the dose. I consider cod liver oil an absolute must for GAPS patients, children in particular, because it supplies them with vitamin A in the most appropriate biochemical form. Look for detailed information about vitamin A in the next chapter. An adult should have **2** teaspoons a day or an equivalent in capsules.
3. **Fish oil with higher ratio of** EPA **to** DHA, as more EPA seems to be beneficial for GAPS patients. There are no toxic levels for these oils.

Start from a small amount added to your child's food (not hot) and slowly build the dose to 1-3 teaspoons a day (up to 1 teaspoon for children under the age of 24 months). An adult should start from a small amount and build the dose up to 3-4 teaspoons a day or an equivalent in capsules.

Make sure that you supplement the oils after food or with food, not on an empty stomach. If you supplement oils on an empty stomach the gall bladder would empty its bile into an empty duodenum in order to deal with the oil, which may cause cramps, belching and nausea.

There are two oils which patients ask about the most, as they contain both omega-3 and omega-6 fats in considerable amounts. These are hemp oil and flax seed oil.

Hemp oil is a fairly recent oil on the market. It contains both omega-3 and omega-6 fatty acids in the ratio of 1:3. It is too heavy on omega-6 fatty acids to be supplemented on its own to GAPS children and adults.

Flax seed oil is too heavy on omega-3 LNA, it contains 4 times as much of omega-3 as omega- 6 fatty acids and also should not be supplemented on its own.

Olive oil is a time-proven health-giving food, used by Mediterranean countries for centuries. The long list of benefits include lowered risk of heart diseases, healing and anti-inflammatory effects, stimulation of bile flow, activation of liver enzymes, antioxidant activity, stimulation of pancreatic enzymes, anti-cancer effects, anti-bacterial and anti-viral activity, membrane development, cell formation and cell differentiation. Virgin olive oil has been shown to improve brain cell maturation and function. And yet it has not got much in the way of essential fatty acids which shows us that we need much more than just omega-3 and omega-6 oils. It contains some LA (omega-6) in a range from 3.5 to 20% and LNA (omega-3) from 0.1 to 0.6%. It is an excellent source of oleic acid (omega-9), a monounsaturated fatty acid, which has an ability to strengthen the Thi arm of the immune system. But the most important elements in olive oil are its minor components: beta carotene, vitamin E, chlorophyll, squalene, phytosterols, triterpenic substances, polyphenols and hundreds of others. Many health-giving properties of olive oil are probably due to these minor components. However, heat, deodorization, refining, degumming and other processing destroys and removes these vital substances. That is why it is very important to buy unrefined extra virgin cold pressed olive oil. "Virgin" means that the oil has been extracted from whole, undamaged

olives without refining. If it does not say on the bottle "virgin" then it is refined. There is no international standard for cold pressing of oils, so different manufacturers mean different things when they say that their oil is "cold pressed". However, there is a distinct difference intastebetweencold pressed virgin olive oil and just virginolive oil, so I recommend buying cold pressed as well as virgin and use it liberally on ready served meals and salads. It is not a good idea to cook with it, as the heat will destroy the minor components and change unsaturated fatty acids into harmful trans-fatty acids. It is best to cook with fully saturated fats, like ghee (clarified butter), butter, coconut oil, goose and duck fat, pork dripping and lard, because they do not alter their chemical structure, when heated, and in small amounts are beneficial to health.

Animal fats have received a great deal of bad publicity in the last few decades. They have been blamed for all sorts of ills, and yet they are an integral part of our anatomy and physiology. They are not called essential, but we cannot live without them. Fat on meat does not just contain saturated fatty acids, it contains very important short-chain fatty acids, monounsaturated and polyunsaturated essential fatty acids. Pork, for example, contains 10% or LA (omega-6) and 34% of monounsaturated fatty acids, which are abundant in our skin and arteries, keeping them supple and soft. Native people in the north of Japan have a very high percent of pork in their diet while being free from heart disease, arteriosclerosis and other health problems, which fats are commonly blamed for. Native people in Mongolia largely live on lamb and lamb fat and yet they are not known for being afflicted with any of the diseases of the western world. We forget that the fatty tissue of animals is not just made of fat, it has got many other substances in its structure, which our bodies need. We do not know everything about these fats yet by a long way. What we do know, however, is that if we try to separate meat from the fat, we get sick. Nature put fat into meat for a purpose and that is how meat should be consumed, together with the fat, collagen and cartilage in it; that is the form our bodies have been designed to take up dietary meat - as a whole. It has been shown in many clinical studies that the protein from meats has to come with the fat to be properly digested and used by the body, when the two are separated various health problems develop. Animal fats contain mainly saturated fatty acids which do not change their chemical structure when heated and are the best fats to cook with.

A rich source of saturated fats is coconut. Coconut and products made out of it (coconut oil and butter, coconut milk, coconut cream, etc.) have

been out of favour in the last decades. Based on ill-founded research and commercial interests coconut and other tropical fats have been blamed for raising blood cholesterol and the risk of atherosclerosis, which made them very unpopular. And yet tropical fats have been used by indigenous people for thousands of years. These people generally are known for very low incidence of atherosclerosis and heart disease.

About 5 0 % of fatty acids in coconut is lauric acid. Recent research shows that in the body lauric acid gets converted into a highly potent anti-viral, anti-bacterial and anti-fungal substance, called monolaurin. Such pathogens as *Candida Albicans, Helicobacter Pylori,* HIV virus, measles virus, herpes virus, cytomegalovirus, Epstein-Barr virus, influenza and many others are susceptible to monolaurin. Lauric acid is also one of the natural ingredients of human breast milk, protecting the baby from infections.

Other fatty acids, found in coconut, are caprylic and myristic acids, which also have a pronounced anti-viral, anti-bacterial and anti-fungal properties. For example, caprylic acid has been in use as an anti-fungal, anti-candida supplement for decades in the form of capsules and tablets.

It is a good idea for GAPS patients to have coconut on a regular basis.

Coconut can provide a natural source of anti-fungal, anti-bacterial and anti-viral substances for these patients as well as many other nutritional factors. The question is - in what form?

People in the tropics use coconut in its natural state. The nut and juice inside are very rich in saturated fats, fibre, vitamins, minerals, vitamin E, tocotrienols, carotene and many other micro-nutrients. Fresh virgin coconut oil, full of flavour, contains most of these useful substances and is used extensively in the tropical countries for cooking, and because it contains saturated fats, it virtually does not change its chemical structure when heated. Unfortunately, coconut oil available in the West is very different from its natural virgin tropical counterpart. It has been hydrogenated to make it harder and to increase its shelf-life. In the process of hydrogenation trans-fatty acids are formed, which are well known to cause atherosclerosis and heart problems. The hydrogenation process requires the use of aluminium and nickel, traces of which would stay in the hydrogenated coconut oil. At the same time the process of hydrogenation destroys vitamins, including vitamin E, carotene, tocotrienols and many other useful nutrients. And as if that is not enough many brands of coconut oil and coconut butter in the West go through a refining process which uses

heat and solvent chemicals; Not surprisingly, studies with this sort of coconut oil show that it does increase blood cholesterol.

As usual, the best thing is to follow nature and have coconut in its natural form. You can get fresh coconuts in most supermarkets. Please, look in the recipe section for different ways of serving it.

In conclusion

The important point is that we should consume natural fats in their natural state without processing them. It is processed foods, which contain masses of unnatural adulterated fats, that should be blamed for our modern health problems: the crisps and chips, margarines and butter replacements, breads and pastries, biscuits and cakes, sweets and chocolates, our TV dinners and other pre-prepared lazy meals, our cooking oils and spreads, our salad dressings and mayonnaise, our sauces and condiments, etc. Eat fats in the form that Nature provided and you will not go wrong! For example, butter is much healthier than any so-called "healthy" synthetic substitutes. I would like to emphasise, that GAPS children and adults need plenty of natural fats. Let them eat the fat on the meat, the skin on the poultry, pour plenty of cold pressed virgin olive oil on their served meals, give them good cod liver oil and fish oil on a daily basis. Supplement their diet with good quality blends of nut/seed oils with **2:1** ratio of omega-**3**:omega-**6** fatty acids (LNA, LA, GLA). As well as olive oil, you can use these oils as a dressing on their salads and ready served meals. Contrary to popular belief, fat is the preferred source of energy in the human body and remember, the brain and the rest of the nervous system are largely made up of fats.

There are some added benefits of supplying your GAPS patient with generous amounts of natural unprocessed fats. The more natural fats the GAPS person has with his/her meals the less he/she will crave sweet and processed carbohydrates, which will make it easier to remove these harmful foods from the diet. And as you get processed foods out of the diet, you will automatically get the bulk of harmful hydrogenated fats and trans-fats out as well.

A good supply of natural dietary fats has another benefit, important for GAPS patients, it stimulates bile production. Secreting bile is the natural way for the liver to rid itself of toxins. GAPS children and adults are very toxic people. The bulk of detoxification in the body happens in the liver. Allowing the liver to drain itself on a regular basis will help the patient to detoxify quicker.

We live in a world of fat phobia, created by commercial interests and funded by them research Fats constitute a large part of our bodily structure and functions. That is why every health problem can be linked to abnormalities in fat consumption: too much unnatural fats and deficiencies in natural fats. Stick to the natural fats and make sure that your GAPS patient gets plenty of them. You will see the results for yourself.

3. VITAMIN A

Vitamin A is a fat-soluble vitamin, which means that it comes as a part of dietary fats. It exists in many biochemical forms. The parent vitamin A is called retinol. Common dietary sources are organ meats like liver and kidneys, dairy products, eggs and oily fish, like herring, sardines and tuna. However, the richest sources are liver oils from marine fish, such as cod, halibut and shark and from some mammals, such as the polar bear. The most accessible liver oil available to us is cod liver oil.

Cod liver oil has been around for a very long time. Our parents remember how their parents gave them a spoon of this oil every day to build up their immune system. Cod liver oil contains omega**-3** essential fatty acids and vitamin D, but its most important asset is probably the vitamin A in its natural pre-formed biochemical shape. Unfortunately, due to digestive problems, GAPS children and adults usually cannot absorb or use other forms of vitamin *A,* commonly found in supplements: retinyl palmitate, retinyl acetate and others, A natural form of vitamin A found in cod liver oil appears to be the best form for these patients.

But why do GAPS patients need supplementation of vitamin A?

Vitamin A deficiency is a big problem in the less developed world. Approximately **350,000** pre-school children become blind each year because of vitamin A deficiency and the majority do not survive (WHO **1996).** But in western countries deficiency in this vitamin is considered to be rare because of the wide consumption of dairy products, eggs and fortified foods. Also the body has the ability to store enough vitamin A, mainly in the liver, to last at least for three months. On top of that vitamin A can be manufactured in the body from a large group of plant-based substances, called carotenoids. There are approximately **600** different carotenoids in nature (in green leafy and brightly coloured vegetables and fruit), **50** of which can be converted to vitamin A. Based on all this knowledge western populations generally are not advised to supplement vitamin A.

However, all this applies to people with healthy digestive systems, which GAPS children and adults do not possess. In people with digestive

problems the picture is very different. The absorption rate of carotenoids can be less than **5%,** which makes them largely useless as a source of vitamin A. Also in order to convert carotenoids into vitamin A the body needs magnesium, zinc, many amino acids and other vital nutrients which, in a person with poor digestion, are always in short supply. To absorb retinol (the pre-formed vitamin A) from dairy products, liver, eggs and other foods a good supply of bile and pancreatic enzymes is needed. Many GAPS patients have whitish pale stools indicating that their bile production and fat digestion are very poor. In clinical practise people who cannot digest fats always present with vitamin A deficiency.

Digestive system problems and vitamin A deficiency are in a "chicken and egg" relationship, where it is not clear which is the chicken and which is the egg. As we have already discovered, poor digestion causes vitamin A deficiency. But vitamin A deficiency can cause digestive problems. In fact gut disease is one of the symptoms of vitamin A deficiency, because the gut lining is one of the most active sites of cell production, growth and differentiation. Neither of these processes can happen properly without a good supply of vitamin A. Leaky gut and malabsorption are the typical results of vitamin A deficiency.

According to WHO **(1996),** in western countries lactating women and infants are two groups at high risk of being deficient in vitamin A. Lactating mothers need to have much more of this vitamin in their diet, than the rest of us, and due to all the modern factors many women in our society may have poor reserves of vitamin A. So it is possible that many infants do not get a good supply of this vitamin in the first months of life, which makes their digestive systems prone to developing problems later on. As always the health of the baby starts from the health of the mother.

It is not only the digestive system which suffers from inadequate supply of vitamin A, its functions in the body are multiple, involving pretty much every aspect of health. It is essential in immune response, brain development, vision, cell differentiation, embryogenesis, reproduction, growth and many other functions.

One of the functions of vitamin A is its role in immunity. In fact, the earliest name for vitamin A was "anti-infective vitamin". In vitamin A deficiency both specific and non-specific immunity are impaired: the humoral response to bacterial, parasitic and viral infections, cell-mediated immunity, mucosal immunity, natural killer cell activity and phagocytosis. Supplementation of vitamin A in children shows proliferation of normal B and T cells and better response to antigens. Acute deficiency of vitamin A

with night blindness and xerophthalmia in the west are indeed rare. But vitamin A inadequacy in the absence of clinical acute deficiency is not rare at all. More than 200 million children around the world suffer from vitamin A inadequacy (WHO 1996). These children do not have any visual problems, typical for deficiency, instead they are very prone to infections, because their immune system does not function properly. Infections, particularly with a high fever, destroy a lot of vitamin A in the body. In clinical practice patients with febrile conditions require supplementation with this vitamin. GAPS children go through numerous ear and chest infections with fever in the first years of life, which would reduce their vitamin A reserves in the body (if they had any reserves) and predispose them to further infections.

Obviously the best way to establish whether your child has a vitamin A deficiency is to test for it. But simply by analysing the clinical picture and health history I would say that all GAPS children and most GAPS adults need supplementation with a natural form of vitamin A, the best source of which is cod liver oil. As always, nature knows best. Clinical experience and some studies show that synthetic forms of supplemental vitamin A (retinyl palmitate, retinyl acetate, etretinate, accutane and others) do not work for these patients.

So, cod liver oil it has to be!

The question is - how much?

A typical cod liver oil would provide 800 micrograms of vitamin A per 10 ml of oil. A teaspoon (5 ml) of this oil would provide 400 micrograms.

Recommended daily allowances for vitamin A (UK, USA, Europe, WHO):

- 0-12 months of age: 150-350 micrograms per day (roughly from a third to an almost full teaspoon of cod liver oil).
- 1-3 years of age: 200-400 micrograms per day (half to a full teaspoon).
- 4-6 years of age: 200-500 micrograms per day (half to a more than a full teaspoon).
- 7-10 years old: 250-700 micrograms per day (roughly two thirds of a teaspoon to almost a full dessert spoon).
- 11-15 years: 250-1000 micrograms per day (from roughly two thirds of a teaspoon to two and a half teaspoons of cod liver oil).
- Adults: 300-1000 micrograms a day.
- Lactating mother: up to 1300 micrograms per day (more than three teaspoons of cod liver oil).

We have to remember that these daily allowances have been established for healthy individuals. Children with vitamin A deficiency can be given as much as **60,000** micrograms of vitamin A as a single dose.

A lot of parents are concerned about overdosing on vitamin A. Indeed in excess this vitamin can be toxic. However, to reach toxic levels you have to have more than **10** times the recommended daily allowance for a period of weeks to years. For an adult that is **20** teaspoons of cod liver oil every day for weeks or years. For a small child - **10** teaspoons a day. I cannot imagine anybody taking that amount of cod liver oil once, let along on a regular basis. To cause an acute toxicity an adult has to have **100** times more than the recommended dose and a child - **20** times more, which translates into **20** teaspoons of cod liver oil for a child of three years of age.

GAPS patients may benefit from larger doses, than the recommended daily allowances. To be completely scientific about it the person should be tested for vitamin A status and according to the result of the test the individual dose can be established, taking into account that absorption of this vitamin can be poor in a GAPS gut. The initial dose may be quite large. Then of course the patient has to be re-tested on a regular basis to re-adjust the dose. However, in real life the majority of patients cannot do that for various practical reasons.

I generally recommend following RDA according to age. This amount of cod liver oil on a regular basis over time would gently correct vitamin A deficiency. The diet, which we have talked about, would also provide considerable amounts of this valuable vitamin. The whole nutritional programme over time would restore proper digestion and absorption of this vitamin, as well as many other nutrients.

4. DIGESTIVE ENZYMES

1. Hypochlorhydria

People with abnormal gut flora almost without exception have low stomach acid production. Toxins produced by overgrowth of *Candida* species, *Clostridia* and other pathogens have a strong ability to reduce secretion of stomach acid.

What does it mean and why is it important?

The stomach is the place where protein digestion begins. Hydrochloric acid produced by the stomach walls activates pepsin, a protein-digesting enzyme, which starts breaking down the very complex structure of dietary proteins into peptides and amino acids. To do its work properly pepsin needs the pH of the stomach to be **3** or below. In hypochlorhydria not enough acid is produced, so the pH in the stomach is not low enough for pepsin to do its job properly.

The most studied proteins in connection with GAPS conditions, particularly autism and schizophrenia, are gluten and casein. In these patients the digestive system converts them into opiate-like substances, called casomorphin and gliadomorphin, which are thought to find their way to the patient's brain and block a lot of normal brain activity and development. The digestion of casein and gluten, just as digestion of all other proteins, starts in the stomach. In a child or an adult with low stomach acidity this digestive process goes wrong from the beginning, which sets up the scene for the formation of casomorphin and gliadomorphin. DrW. Shaw, in the revised edition of his book *Biological Treatments for Autism andPDD,* gives an interesting example of a child, who had a very severe withdrawal reaction, when casein and gluten were taken out of his diet, with violent behaviour and refusal to eat or drink. Indeed withdrawal of opiates in drug addiction can be extremely dramatic. But in this child the withdrawal symptoms were temporarily relieved by regular administration of Alka-Seltzer Gold. Now why would simple bicarbonate Alka-Seltzer Gold have such an effect? Maybe the answer is that by neutralising whatever little stomach acid the child had, Alka-Seltzer Gold interfered with the digestion of other dietary proteins with production of other opiate-like peptides, which were giving this child a temporary "morphine fix", reducing the withdrawal symptoms?

As a result of low stomach acid production the whole process of protein digestion in the body goes wrong from the very beginning. The maldigested protein then passes through into the small intestine. The intestinal wall and pancreatic enzymes, which accomplish further steps in the protein digestion, expect the protein to arrive from the stomach in a particular form in order to do their job properly. It is like a conveyer belt or an assembly line in a factory. If the first person does a poor job, then no matter how well the rest of the people in the line may work, the end product is likely to be of a poor quality. However, what happens in the body is even worse. The problem is that in the body "the rest of the line" cannot work properly either, because it is regulated by the "first person". This first person is the stomach acid. Stomach acidity is the major regulator of pancreatic and liver ability to respond to arriving food. In a normal situation food coming from the stomach into the duodenum has to have a pH of **2** or below to stimulate production of two very important players in the whole digestive process. These players are two hormones, produced by the walls of the duodenum, which get absorbed into the blood and carried to the pancreas, liver, stomach and many other organs in the body. These hormones are secretin and cholecystokinin. The first hormone, secretin, gives the stomach a command to stop producing its juices, stimulates the liver to produce bile and lets the intestinal lining know that food is coming, so it makes enough mucous to protect itself. But the most important thing that it does is to stimulate the pancreas to produce alkalising bicarbonate solution to neutralise the acid in the food, which has just arrived from the stomach, because normally the duodenum and the rest of the small intestine have a far more alkaline pH. This alkaline pH is essential for pancreatic enzymes to do their job of digesting proteins, fats and carbohydrates. By stimulating production of bicarbonate secretin prepares the food for the digestive enzymes coming from the pancreas.

To produce these digestive enzymes the pancreas needs the command of the second hormone - cholecystokinin. If cholecystokinin is not made by the walls of the duodenum because of too little acid coming from the stomach with the food, then the pancreas will be sitting there idly and not producing its digestive enzymes to deal with that food. In addition, cholecystokinin tells the stomach to stop its activity, makes the gallbladder empty its bile into the duodenum, ready to digest fats, and opens the gates for pancreatic juices to flow and start digesting arriving food (FIG.7).

These two hormones are so important in normal food digestion that without them this digestion simply cannot happen. Unfortunately, in a

person with low stomach acidity that is exactly what happens. The food comes from the stomach not acid enough to trigger the production of secretin and cholecystokinin. So, the pancreas does not produce its juices and bile is not secreted to work on the fats. Maldigestion and malabsorption follow. Partially digested proteins, like casomorphin and gliadomorphin and many others get produced and absorbed through the damaged leaky intestinal wall, acting as opiates in the brain. Other maldigested proteins cause allergies and autoimmune reactions, draining an already compromised immune system even further. A lot of essential vitamins, amino acids and minerals do not get absorbed, causing nutritional deficiencies. Maldigested carbohydrates get consumed by abnormal flora, which converts them into alcohol, acetaldehyde and a whole host of other toxins. Fats do not get digested, which makes the person deficient in extremely important fat soluble vitamins A, D, E and K, essential fatty acids, and gives the person pale floating stool or diarrhoea. Undigested food simply rots in the digestive tract, poisoning the whole body.

Secretin has received a lot of publicity in autistic circles since some cases of great improvements were seen after injecting autistic children with secretin. Soon homeopathic forms of this hormone became available. Cholecystokinin is available as a supplement in the USA and some parents who tried it with their children apparently reported similar to secretin effect. Unfortunately, the majority of autistic children show very little or no response to this treatment, because secretin is only one factor in a very complex digestive process. Normalising stomach acid production is a far more important intervention in order to put the whole digestive process right from the beginning.

Apart from literally ruining the whole digestive process, lack of acid in the stomach has other serious implications.

Stomach acid is the first barrier for huge numbers of microbes arriving with every bit of food or drink we put into our mouths. If the stomach is not acid enough, these microbes have a good chance of getting into the intestines, which they would colonise and cause trouble. They even start growing in the stomach itself! Normally the stomach is the least-populated area of the digestive system due to its extremely acid environment. However, in a person with hypochlorhydria all sorts of pathogenic and opportunistic bacteria and fungi can grow on the stomach wall, such as *Helicobacter pylori, Campylobacter pylori, Enterobacterial Candida, Salmonella, E. coli, Streptococci,* etc. The most research in this area has been done in stomach cancer patients, the majority of which show low levels of

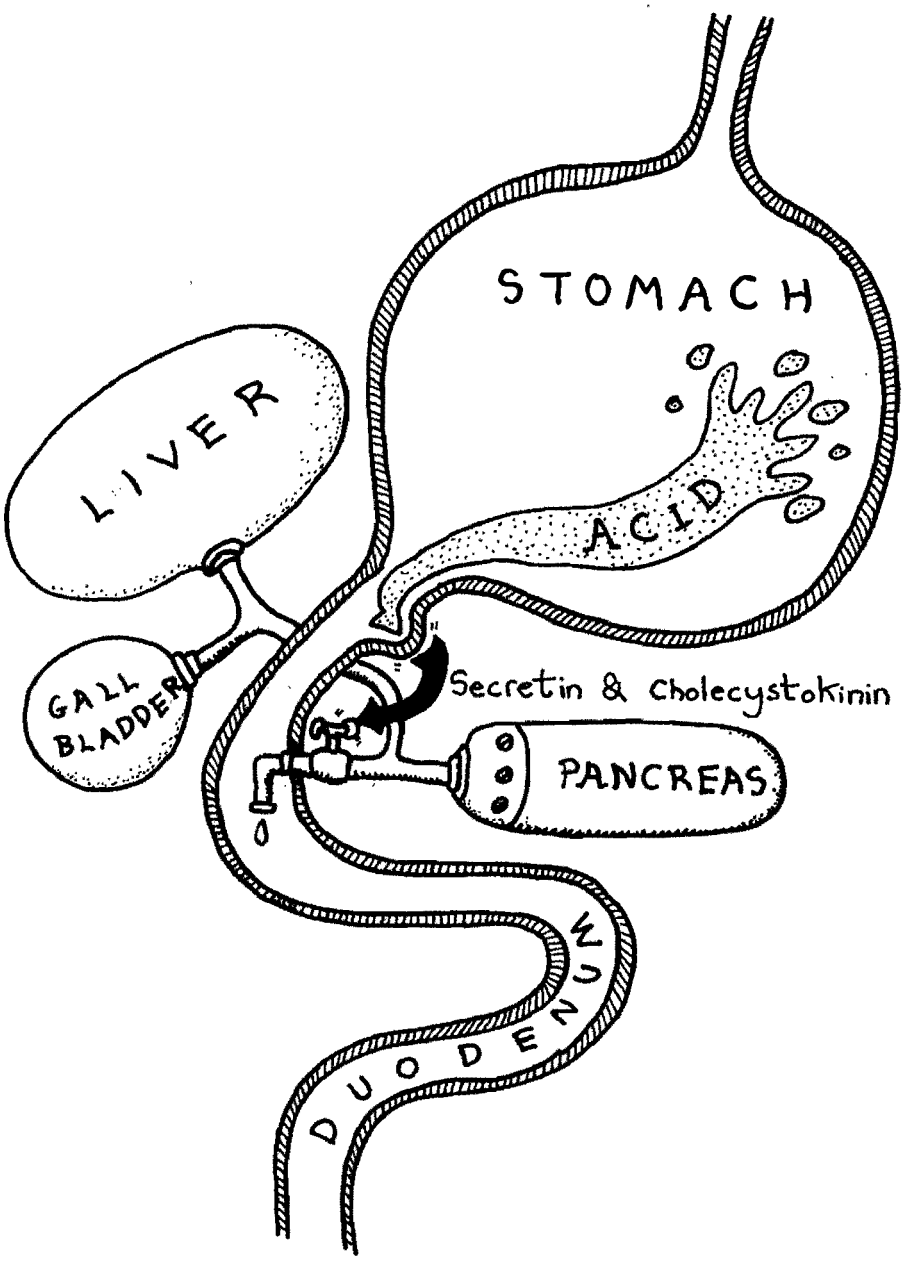

FIG. 7 Regulation of digestive process by the stomach acid.

stomach acid production. Microbes, which populate low acid stomach play a very important role in causing stomach cancer, ulcers and gastritis.

Of course, most of these microbes love to eat carbohydrates, particularly the processed kind. The digestion of carbohydrates starts in the mouth with the action of saliva. When the food arrives into the stomach in the normal situation stomach acid stops this digestion. So, carbohydrates have to wait until they arrive at the duodenum to be digested. But in the stomach with low acidity overgrowing microbes start fermenting dietary carbohydrates, often with the production of various toxins and gas, which can make it very uncomfortable for the GAPS child or adult and make them refuse food.

So, what do we do?

I believe that GAPS patients need supplementation with stomach acid. The most physiological preparation available on the market is Betaine HC1 with added Pepsin. One capsule usually provides **200-300** mg of Betaine HC1 and loomg of Pepsin. It should be taken at the beginning of each meal. The capsules usually contain an adult dose. However, I find that children as young as eight can take this dose without any trouble. To determine the right dose for your child start from a small pinch of the powder added to the first spoonfuls of the meal. In two to three days increase to two pinches and so on. For children from **18** months to **24** months one pinch is usually enough. For two to three year olds two to three pinches. For four to six year olds half a capsule is enough. For six and older from half to a full capsule. Children older than **10** and adults may need two capsules at the beginning of each meal. A lot of parents report great improvement in their child's stool in just a few days from starting Betaine HC1 with Pepsin. Make sure that you do not give probiotic to your child together with Betaine HC1 as the acid is likely to destroy the probiotic bacteria. Give the probiotic first thing in the morning, between food or after food when the stomach acid is at its lowest.

Apart from supplementing stomach acid there are natural things we can do to stimulate the body to produce its own stomach acid. Cabbage juice is one of the strongest stimulants. Having a few spoonfuls of cabbage juice or a small cabbage salad before the meal will help to digest that meal. Sauerkraut and its juice are even stronger. A small helping of sauerkraut or a few tablespoons of its juice will prepare the stomach for the arriving food. Having a cup of home-made meat stock with your meal will also help to increase stomach acidity. With children the easiest thing to do is to give them a cup of home-made meat stock with a few spoonfuls of sauerkraut juice or cabbage juice mixed in it.

2. Pancreatic Enzymes

These are the enzymes that people are talking about when they say "digestive enzymes". They usually include a mixture of proteases, peptidases, lipases, amylase, lactase and cellulase, which normally would be breaking down your food in the small intestine. In a healthy digestive tract most of these enzymes are produced by the pancreas. If we can restore normal stomach acidity then this stage in digestion should go without any problem, because the stomach acid would trigger the pancreas to produce its own enzymes. That is why I consider restoring the stomach acid level far more important than supplementingparicreatic enzymes.

There has been a polemic in autistic circles about supplementing some peptidases and proteases to replace the diet (meaning the GFCF diet, of course). The idea was that these enzymes would break down gluten and casein, so that there would be no need to struggle with implementing the diet. Not surprisingly this approach did not work for the majority of people, because enzymes can never replace a diet. The diet, which we describe in this book is designed to heal the gut and to re-establish normal gut flora. No enzyme can do that!

Generally in my clinical experience I see a lot of improvement from supplementing stomach acid. However, I do not see much happening from supplementing pancreatic enzymes. If the patient feels that they really help then there is no reason why he or she should not take them, providing the tablet does not contain fillers or binders which may interfere with the healing processes in the gut. In my experience the majority of patients do very well with just supplementing stomach acid, because it will trigger production of their own pancreatic enzymes through secretin and cholecystokinin, as well as triggering bile secretion and many other important players in the digestive process, making it far more natural.

Digestive enzymes do not need to be taken permanently. As the gut starts healing the person can slowly withdraw the stomach acid supplementation and/or pancreatic enzymes, taking them only with heavy meals or if something not allowed on the diet has been eaten.

5. VITAMIN AND MINERAL SUPPLEMENTATION

A vitamin is a substance that makes you ill if you don't eat it.
Albert von Szent-Gyorgi (1893-1986)
Hungarian-bom US biochemist

GAPS patients have many nutritional deficiencies, so it is a natural desire to get rid of them. The question is: how?

Is it a matter of simply testing how much magnesium, for example, a person is missing and then supplementing that amount? Or is it a matter of taking a supplement "specifically designed" for autism or ADHD or schizophrenia, using the "one size fits all" approach? Maybe we should just give megadoses of all the nutrients, which the person is deficient in, hoping that the body will sort it all out?

Many health practitioners turn to testing for nutritional deficiencies. For every nutrient there are optimal tests, which are considered to give the most accurate information about that particular nutrient, and there are less optimal tests, which may be quite misleading. Trying to use the most optimal test for every nutrient is impractical and can be very expensive. So, usually one or two tests are performed for all the nutrients at once, which does not represent the true picture. So, trying to work out a nutritional supplementation protocol based on these tests is shaky from the start.

On top of that, many supplements on the market have a very low absorption rate, some about **9%,** so the amount the patient's body would actually get can be way below what it says on the bottle. But, of course, the majority of manufacturers would not tell you on the bottle how low the absorption rate of their supplement is, even if they knew. So, choosing a supplement can be quite difficult.

Absorption of supplements is a complicated process which, apart from the quality of the supplement, also depends on the state of the patient's digestive system. Two different people may absorb different amounts of nutrients from the same supplement. GAPS digestive system is generally not in good shape and may not absorb any of those nutrients particularly well.

To complicate the whole matter even further, many nutrients compete for absorption sites in the gut. So, if we supplement too much calcium, for

example, it may impair absorption of other nutrients: magnesium, zinc, copper, iron, some amino acids and others, creating deficiencies in those nutrients.

Indeed this is a very confusing area of nutrition. The truth is nobody knows how to prescribe vitamins and minerals because we do not have enough research or knowledge on this subject. Every nutritionist or medical practitioner has his/her own collection of favourite supplements and that is what they usually use on most of their patients. lust as with mainstream psychiatry, where drugs are used mostly on a trial-and-error basis, the same method is used in prescribing vitamin and mineral supplements.

Taking vitamin and mineral supplements has become very common not only because many of us take "health-pills", but because a lot of foods are fortified with vitamins and minerals to compensate for the loss of those nutrients in the food processing, not to mention the fact that many foods are grown using intensive farming techniques, which makes them nutrient poor from the start. Unfortunately, a lot of these supplemented nutrients are synthetic. The body has been designed to use natural forms of these nutrients and often does not recognise the synthetic forms and does not know what to do with them. There is a growing suspicion that a lot of cases of kidney stones, for example, are caused by supplementing synthetic forms of vitamin C, which would represent most vitamin C supplements available in the shops.

There is a highly publicised opinion that in our modem world we cannot be healthy without taking nutritional supplements, because our diet cannot provide us with optimal amounts of nutrients. Indeed, if you live on cereal and toast for breakfast, sandwiches for lunch and a standard dinner you will not provide your body with optimal amounts of nutrition and you will have to take supplements. The diet, which is described in this book, will provide you with concentrated amounts of nutrition in a natural form, which the body recognises and knows what to do with. luicing will add more concentrated amounts of vitamins, minerals and other useful substances. A good probiotic on average increases absorption rate of nutrients from food by **50%** or more. On top of that probiotic bacteria are supposed to be the main source of vitamins B, K, bio tin and many other substances in the body. Indeed, that is the first group of nutritional deficiencies which usually disappear when the patient starts taking therapeutic doses of a strong probiotic. The diet and probiotic will start healing the digestive system, so the patient will start absorbing the nutrients from the food properly.

Another important point we have to consider when it comes to our GAPS patients is that their digestive system is inflamed and damaged. A lot of synthetic supplements, fillers and binders in tablets and capsules will aggravate and irritate already sensitive GAPS gut lining and interfere with the healing process. I have seen many patients who put a lot of effort into implementing the diet, but would not achieve the best results until they removed most of their supplements.

That is why I normally do not recommend any vitamin or mineral supplementation at the beginning of the programme. I recommend putting most effort into implementing the diet first and starting the healing process in the gut. Once the digestive system starts working properly in many patients their nutritional deficiencies disappear without any supplementation! They disappear the natural way through the body sorting it out for itself.

Of course, aU patients are different and some of them require targeted supplementation. But that is a matter for a qualified practitioner to decide. Here are some important points to keep in mind.

- Choose supplements without any ingredients which may aggravate the gut condition. Supplements in a liquid form are better than in powder, tablet or capsule. Substances, which are not allowed on the diet, should also be out.
- Choose supplements with a high absorption rate, for example, vitamin and mineral supplements with added fulvic acid. Fulvic acid (not to be confused with folic acid) is produced by bacteria in soil. It can ensure a very high absorption rate for a supplement the natural way. It also has good chelating properties for heavy metals. Soil bacteria in your probiotic will provide your gut with this acid.
- Keep supplements to an absolute minimum!

DETOXIFICATION FOR PEOPLE WITH GAP SYNDROME

Never go to a doctor whose office plants have died.
Erma Bombeck

We live in a polluted world. Every day we breath in car fumes and industrial wastes. We eat foods containing pesticides, herbicides and other agricultural chemicals. We drink milk and eat meat from animals which are routinely given antibiotics, steroids and other drugs. We eat a countless number of various chemicals in processed foods. We use personal care products full of various chemicals shown to be carcinogenic and generally toxic for humans. Our modem energy-conserving homes and offices have become toxic places. Modern building materials, insulation, paints, domestic cleaning chemicals and fire retardants all outgas toxic substances which we breathe day in and day out. For example, chemical analysis on outgassing of common carpets and carpet adhesives in modern homes found considerable amounts of toxic substances such as formaldehyde, toluene, xylene, benzene, methacrylate, tetrachloroethylene, methyl naphthalene, phthalates and styrene. All these chemicals are known toxins for a human and we breathe them in large quantities all the time we are at home. Hospitals and shopping centres have even higher amounts of toxic substances in the air, that is why many people feel so tired and drained after a shopping trip or a long visit to a hospital. And as if all that is not enough, we routinely take prescription drugs, drink alcohol and smoke tobacco.

So, how do we survive? How do we manage to live our lives, go to work, have children, without just dropping dead after our first breath of traffic-jam air in the morning?

We survive thanks to a very important system in our bodies. A system which until recently we did not know much about - a DETOXIFICATION SYSTEM.

It is a system, which is like a cleaner in the body. It constantly cleans out all the toxins, produced as a result of normal body metabolism, and toxins arriving from the outside. It has got its headquarters in the liver and departments in every cell of the body. The sophistication and complexity of this system is staggering to even the most knowledgeable biochemists

and there is a lot we still don't know about how it works so efficiently. But what we do know is that this system, in order to function well, has to have a constant supply of certain nutrients: zinc, magnesium, selenium, molybdenum and other minerals and trace elements, hundreds of enzymes, many amino acids and essential fats - all the substances which our GAPS children and adults are deficient in. Due to these deficiencies the detoxification system cannot function at an optimum level in a GAPS person. At the same time this system is overloaded with work, because GAPS patients are very toxic people. Imagine a worker, who is being starved of food and drink, and at the same time is being given more and more work to do. How is he going to cope? He is going to put most of this work into a backlog, hoping for easier times when he would be able to attend to it. That is exactly what the detoxification system does in a GAPS patient - it stores various toxic substances in different tissues in the body in order to deal with them later. That is why when these patients are tested for heavy metals, petrochemicals and other toxins they always test positive. Unfortunately, a lot of these chemicals have affinity for fats and therefore get stored in body fats. A human brain and the rest of the nervous system have a very high proportion of fats in its tissues and become a storage site for these toxins. A brain clogged with toxicity cannot develop or function well. We see this very clearly in GAPS patients.

So, what do we do? How do we lift off this toxic load from our GAPS children's and adult's bodies to allow them to develop and function properly?

The first and most obvious thing to do is to remove the main source of toxicity, which means cleaning up and healing the gut.

However, removing the major source of toxicity is not enough. What do we do with all the toxins stored over the years in these patient's bodies? What do we do with all the heavy metals, which GAPS children and adults test positive for?

In recent years a new treatment has emerged - chelation of heavy metals with chelating drugs, mainly DMSA (Dimercapto Succinic Acid) and Alfa-Lipoic Acid. It is a group of drugs initially used in the army for treating acute exposure to heavy metals and other toxic substances. It is a hot topic at the moment within the circles of parent groups of autistic children. There are a number of practitioners, mainly in the USA, who **will** administer these drugs to autistic children and who claim benefits for this treatment. We hear stories from parents who feel that chelation has helped their child. However, there are a number of issues here, which a lot of

people, including me, do not feel comfortable about. Chelating drugs are drugs. Like any drug they come with side effects and complications. These are not benign substances. I have great concerns at the idea of using these drugs without direct local medical supervision, let alone without regular blood monitoring. Let's have a look at some known problems.

1. DMSA and other chelating drugs cause dose-related bone marrow suppression, which manifests as neutropenia and thrombocytopenia, which can affect blood clotting and blood immune response to infections and other toxins. Patients, who are on a chelation programme have to have their blood composition monitored on a regular basis. In some children and adults this reaction is serious enough to discontinue chelation.
2. Chelating drugs cause an explosion of pathological fungal and bacterial growth in the gut, probably due to the immune system suppression. That is why doctors who practice chelation advise their patients to deal with their gut dysbiosis first before trying to chelate. Anybody who has any experience with treating gut dysbiosis knows how difficult it is to deal with it. GAPS patients have gut dysbiosis as their most basic and primary pathology and with all the experience in treating it we still cannot say whether you can completely get rid of it.
3. Apart from taking out heavy metals chelating drugs bind essential minerals as well and take them out of the body. They chelate zinc, for example, that is why zinc has to be supplemented in very high doses prior and during chelation. However, doctors who have an experience with supplementing zinc know that it has a very complex absorption mechanism, which requires normal stomach acidity. GAPS patients do not have normal stomach acidity, which impairs absorption of supplemented zinc. On top of that we know that GAPS patients are already deficient in this essential mineral quite severely. Apart from zinc, chelating drugs chelate other essential minerals, which these patients are already deficient in, like magnesium, molybdenum and others. That is why chelation protocols include very heavy supplementation with a large number of different nutrients.
4. Patients on chelating drugs show high amounts of enzymes called transaminases in their blood, which is an indication of liver damage, specifically damage to hepatocytes (liver cells).
5. Chelating drugs are contraindicated in people with any renal problems because they have a damaging effect on kidneys. Kidney

function as well as liver function has to be regularly monitored during chelation.

6. During chelation a long list of side effects are reported by the parents of autistic children: regression in autistic symptoms, anorexia, fatigue, irritability, nausea, sleep disturbances, diarrhoea, flatulence, macular-papular skin rash. In some cases such serious complications were observed by doctors as Stevens-Johnson Syndrome (severe toxic reaction with high fever, diarrhoea, polyarthritis, erosive skin rash, myalgia, pneumonitis - usually treated with steroid medication), hemolysis (red blood cells destruction), as mentioned above, serious neutropenia (low count of blood cells, called neutrophils, which are involved in immune response) and thrombocytopenia (low count of thrombocytes, which are blood cells mainly responsible for blood clotting).
7. A number of autistic children are reported to be better while taking chelation drugs, but regress back to the previous state as soon as chelation stops. One explanation for this phenomenon may be **that** these children just re-accumulate heavy metals from the environment as soon as the chelation stops, because their own detox system is unable to deal with these metals.

There is no hard or soft data available yet that chelation really works, only anecdotal evidence. There are a few studies on the way, which are trying to assess any improvements from chelation, but the success rate is still unknown. If GAPS patients do improve after chelation, we do not know yet to what extent they improve to justify puttingthem through all the risks and side-effects of this treatment, not to mention the expense.

So, what do we do about all these heavy metals and other toxins lurking in our patient's bodies? We can't just forget about them. Well, there is a time-proven way of detoxifying, taking out of the body not just the heavy metals but a lot of other poisons as well without any side-effects or harmful complications. And a very tasty way too. Children in particular love it! This way is JUICING. Thousands of people all over the world freed themselves from the most deadly diseases with juicing, dozens of books have been published on this subject full of testimonies and hundreds of wonderful recipes. Some very big names in natural medicine strongly advocated juicing and used it actively in the treatment of their patients - people like Dr Gerson and Dr Norman Walker for example. Hundreds of scientific studies have been published on the health benefits of fresh raw fruit and

vegetables. Juices provide all the goodness from these fruit and vegetables in a concentrated form and in large amounts. For example to make a glass of carrot juice you need a pound of carrots. Nobody can eat a pound of carrots at once, but you can get all the nutrition from them by drinking the juice. On top of that juicing removes the fibre, which impairs absorption of many nutrients in fruit and vegetables and aggravates the condition in the already sensitive digestive system of a GAPS patient. The digestive system has virtually no work to do in digesting juices, they get absorbed in **20-25** minutes, providing the body with a concentrated amount of nutrients. With juicing you can consume large quantities of fresh vegetables and fruit every day in the most digestible and pleasant form. A lot of GAPS children and adults would not eat fresh vegetables and fruit due to their texture. Drinking juices can solve this problem very efficiently. Some GAPS children would not drink enough liquids either. Juices, being so tasty, can provide a good solution to this problem too. Drinking at least two cups of freshly extracted juice will provide your patient with many essential vitamins, magnesium, selenium, zinc and other minerals, amino acids and lots more nutrients, which GAPS people are deficient in. A combination of pineapple, carrot and a little bit of beetroot in the morning will prepare the digestive system for the coming meals, stimulate stomach acid production and pancreatic enzymes production. A mixture of carrot, apple, celery and beetroot has a wonderful liver-cleansing ability. Green juices from leafy vegetables (spinach, lettuce, parsley, dill, carrot and beet tops) with some tomato and lemon are a great source of magnesium and iron and good chelators of heavy metals. Cabbage, apple and celery juice stimulates digestive enzyme production and is a great kidney cleanser. There is an endless number of healthy and tasty variations you can make from whatever fruit and vegetables you have available at home. To make the juice taste nice, particularly for children, generally try to have **50%** of less tasty but highly therapeutic ingredients: carrot, small amount of beetroot (no more than 5% of the juice mixture), celery, cabbage, lettuce, greens - spinach, parsley, dill, basil, fresh nettle leaves, beet tops, carrot tops, white and red cabbage, and **50%** of some tasty ingredients to disguise the taste of the rest of the ingredients: pineapple, apple, orange, grapefruit, grapes, mango, etc. (for more detail look in the recipe section).

What about fibre? Drinking juices doesn't mean that the patient stops eating fresh fruit and vegetables. Providing there is no diarrhoea the GAPS person should carry on eating fruit and vegetables as usual. Treat the juices like a supplement of concentrated amounts of nutrients in a glass. They

should be taken on an empty stomach 20-25 minutes before food and 2-27a hours after a meal.

But can't we just buy juices in the shops? The answer is a big NO! Juices in the shops have been processed and pasteurised, which destroys all the enzymes and most vitamins and phytonutrients. They are a source of processed sugar, which will feed abnormal bacteria and fungi in the gut, In freshly extracted juice the natural sugars are balanced with enzymes, minerals, and other nutrients which turn them into energy for the body. When you make your juice at home you knowwhatyou put into it, you knowthat it is fresh without any contamination and oxidation, and you can have great fun by mixing different fruit and vegetables together, making different tasty combinations. There are a large number of books on juicing with wonderful recipes for every health problem and every occasion. To turn your juices into a powerful immune remedy consider adding black elderberries to it

Black Elderberry

Black Elderberry is a small tree, which grows pretty much everywhere from cold to very warm climates. In spring it bears clusters of tiny whitish flowers which at the end of the summer turn into small juicy black berries. Medicinal properties of this plant have been appreciated for centuries. Its flowers, berries, leaves and bark were traditionally used for treating colds, pneumonia, flu, sore throat, hay fever, wounds, eye infections and many other ailments. In England the berries are still used for making elderberry wine, in Scandinavia the flowers are used for making elderflower cordial Black Elderberry has got strong immune-stimulating properties and it is one of the most powerful anti-viral remedies known to man.

You do not have to be an experienced herbalist to use this plant. Many people have this tree in their gardens as it is quite decorative. At the end of the summer collect clusters of berries, a small bucket would be enough. Make sure that you collect ripe berries - ripe berries are very black and squashy. At home separate the berries from their twigs using a fork. Put the berries into small plastic bags or small containers and freeze them. From the end of summer/beginning of autumn make it your bed-time routine to take i~2 tablespoons of berries out of the freezer and leave them at room temperature to defrost overnight In the morning juice them together with pineapple, carrot or any other fruit and vegetables you planned to use. If you do it every day or every other day throughout the cold season your

family will not have any colds. A small amount of 1-2 tablespoons of berries is enough for a family of four. If you are juicing just for one person, then one teaspoon is enough. Apart from juicing you can add elderberries into your cakes.

You can also collect flowers in spring and freeze them. During the winter they would make a very pleasant aromatic tea or you can just crush them, while frozen, with your hand and add them to your salads. The flowers also have strong immune-stimulating properties. Use them as a tea to remedy colds, flu and fever. The same tea can be used topically on wounds and grazes, sunburn, frostbites and sore eyes. It is also a traditional remedy for hay fever.

I can just hear somebody saying "I am a very busy person and do not have time to be collecting berries and flowers!" But even the busiest person has got weekends. Isn't it a pleasure to spend a day with your family out in the country, when you can collect elderberries? When you come home in the evening and slump in front of your TV, you can separate the berries from their twigs with a fork and put them into small freezer bags, while watching your favourite programme. When the programme is finished, you can put the bags into your freezer. Not that much of an effort for having a winter supply of a wonderful immune-stimulating remedy. And it will cost you absolutely nothing!

The general toxic load

An important part of the treatment is reduction in the general toxic load on the patient's detoxification system as much as possible. What is a general toxic load? Anything toxic we eat, breathe, touch or put on our skin absorbs very quickly and puts another workload on our detoxification system. In a GAPS person his or her gut is the major source of toxicity overloading the detox system with too much work. It is not sensible to add more to that work by exposing the patient to toxic and carcinogenic sub™ stances from the environment What substances are we talking about?

The patient's house should be kept as chemical free as possible by using minimal amounts of domestic cleaning chemicals, paints, carpet pesticides and other toxic substances. All widely available domestic chemicals are toxic. Bathroom detergents, floor cleaners, polishes, etc. all stay in the air and on the surfaces contributing to the general toxic load on the patient's detox system. Toxic domestic chemicals can be replaced with safer bio-degradable alternatives from various conscientious companies.

However, generally try to use as little as possible. A lot of cleaning around the house can be done with just water and a bit of vinegar or lemon juice, bicarbonate of soda and olive oil. You can clean your wood floors with strong tea. You can polish your furniture with a mixture of 1 cup of olive oil with 7a cup of white vinegar. You can pour white wine on red wine spills on your carpet to remove the stain.

It is wise not to re-decorate the house or install new carpets or furniture while the patient is trying to detoxify. Paints, many building materials, new carpets, new furniture outgas a plethora of extremely toxic chemicals which we absorb through our lungs, skin and mucous membranes. New carpet can outgas considerable amounts of highly carcinogenic formaldehyde for a few years. New furniture is full of fire retardants, which are great contributors of antimony (a toxic heavy metal) in our systems. Fresh household paints outgas dozens of extremely toxic chemicals into the air of the house for at least six months. Just recently I had a phone call from a parent of an autistic child who, apart from severe autism, had epilepsy. After implementing the GAPS nutritional protocol the seizures disappeared completely and the child was doing very well. Then, unfortunately, the parents decided to paint the walls in the house. The day the painter started work the child had a major epileptic fit. Epilepsy in a majority of cases, particularly in children, is caused by toxicity. Obviously, this child's detoxification system was not ready to take an onslaught of the extremely toxic chemicals which we can breathe in from paints.

Very important contributors to the general toxic overload in the body are *cosmetics, toiletries, perfumes and other personal care products.* The personal care products industry is generally not regulated. More than a thousand of various carcinogenic and toxic chemicals are widely used in formulation of shampoos, soaps, toothpaste, cosmetics, perfumes, creams, etc. The old opinion that our skin is a barrier and does not let toxins in has proven to be completely wrong. Human skin absorbs most things from the environment very efficiently, in some cases even better than our digestive system. Toxins, which go into the body through the digestive system, have to pass through the liver, where most of them get broken down and rendered benign. That is why the pharmaceutical industry recently started producing more and more drugs which are applied to the skin as patches, because the skin absorbs them better than the digestive system and they get straight into the bloodstream without passing the test of the liver. The wide use of personal care products is a major contributor to our cancer epidemic. Children, women and men are unknowingly exposing

themselves to huge amounts of carcinogenic substances, which they apply to their skin. A good example is breast cancer. Cells removed from a cancerous breast in many cases are full of aluminium - a toxic heavy metal. Where does all this aluminium come from? Probably from not far away - from the deodorants, absorbed through the skin in the woman's armpits. Recent research into heavy metals showed that when a pregnant animal is exposed to them they accumulate in large amounts in the foetus. That is why it is particularly important for a pregnant or breast-feeding mother to be careful what personal products and cosmetics she puts on her skin, face and hair. In this book we cannot go into the details of all toxins present in our toiletries and cosmetics. But let us list some of the most common ones.

- Talc or talcum powder can cause ovarian cancer. Do not use it, particularly on babies!
- Sodium Lauryl (Laureth) Sulfate (SLS) - highly toxic detergent and is present in most shampoos, soaps and toothpaste.
- Fluoride - a terrible poison for every system in the body. Widespread in toothpaste and other dental care products. It is added to some water supplies and given to babies as drops. If you are not familiar with its toxicity I would strongly advise you to learn more about it and avoid it like the plague.
- Titanium Dioxide - carcinogenic.
- Triethanolamine (TEA) and Diethanolamine (DEA) form carcinogenic nitrosamines.
- Lanolin, itself a non-toxic natural substance is often contaminated with DDT and other carcinogenic pesticides.
- Dioxanes are inhaled and absorbed through skin - highly carcinogenic.
- Saccharin - carcinogenic.
- Formaldehyde - a toxic and carcinogenic substance.
- Propylene Glycol - carcinogenic.
- Lead, aluminium and other heavy metals are present in many personal care products, particularly in deodorants and make-up.

In patients with GAP syndrome use of personal care products should be reduced to an absolute minimum. The body does not need washing with soaps, shower gels or bubble baths. They not only contribute to the general toxic overload, but they also wash off important oils, which protect the skin from infections and drying out. Washing with water and a sponge should be quite enough.

A child does not need any personal care products apart from natural toothpaste. There are number of companies who produce safe personal care products without harmful substances, listed above.

To assist elimination of toxins through the skin, give your child a bath every night before bed. Instead of bath soaps, add a cup of cider vinegar to the bath, it will help to normalise the pH of the skin and encourage appropriate skin flora, as well as assisting the detoxification process. On alternate days add a cup of Epsom Salt to the bath, which will also assist in the detoxification process. Air your house regularly and let your child spend as much time as possible in the fresh air.

Swimming pools are very toxic places. People generally believe that going to the swimming pool is a healthy exercise. This cannot be further from the truth. Apart from a few rare pools in the world, sterilised with ozone, the rest of them use chlorine-based chemicals for sterilising the water. Chlorine is a poison, which affects every system in the body, particularly the immune system and liver. It absorbs quite well through the skin. But apart from that a thick layer of chlorine gas is floating above the swimming pool water, which children and adults inhale while swimming. Inhaled chlorine absorbs extremely well through the lungs into the bloodstream. GAPS patients are already very toxic. Swimming in a chlorinated pool would add to that toxicity.

GAPS people should swim in the natural waters of lakes, rivers and sea instead of the toxic chemical soup of swimming pools. Natural waters are full of life, biological energy from plants and different creatures, minerals, enzymes and many other beneficial substances. Swimming in natural living waters has been prized as a therapy for many health problems for centuries. Obviously, you have to make sure that the water you swim in is as far as possible from any source of industrial pollution.

Washing powders and liquids all stay in the fabric of our clothes, bedding and towels and also contribute to the toxic overload. Try to look for safer ecologically friendly alternatives.

Houseplants are our great friends when it comes to keeping our houses toxin free. They consume the toxic gases and replace them with oxygen and other beneficial substances. Fill your house with geraniums, ivies, spider plants, Aloe Vera, ficuses and many other varieties of houseplants. The more the merrier, particularly in your bedrooms! Keep your houseplants healthy, don't let them become mouldy, as some GAPS people may react to moulds.

Detoxification and reducing exposure to environmental toxins has to be an important part of the treatment of GAP Syndrome. Normalising gut ilora, appropriate nourishing diet, clean water, juicing and avoiding exposure to toxins are the natural measures which work very well and without any side effects!

A healthy body is clean inside!

Happy cleaning!

PART THREE:
DIFFERENT ISSUES

i. EAR INFECTIONS AND GLUE EAR

Ear infections and glue ear are the most common reasons why GAPS children are prescribed so many antibiotics in their first years of life. But if we look at ear infections and glue ear on their own, we will see another epidemic. Ear infections account for more than a third of all visits to GPs. Around two-thirds of all children in the western world have ear infections at some time every year, with one-third having more than four ear infections a year.

Why do we have this epidemic? Why do so many children finish up with ear grommets after endless courses of antibiotics for acute ear infections?

To understand this phenomenon we have to look at the structure of the ear.

Ear infections happen in the middle ear, which is quite a small enclosed space - its volume is about 1 cubic cm. Its main function is to pass the sound from the eardrum to the inner ear, which it does very efficiently with a system of three interconnected tiny bones. The middle ear is filled with air and is separated from the outer ear canal by the eardrum. However, it is connected with the outside world with a tube called auditory or Eustachian tube. This tube is the most important player in ear infections and glue ear, so I would like to concentrate on it in detail.

The Eustachian tube stretches from the inside wall of middle ear to the nasopharynx (back of your nose and throat), where it opens quite near the back of the nose. The major function of this tube is to equalise the pressure in the middle ear with the atmospheric pressure. The opening of the Eustachian tube in the pharynx is guarded by a lump of lymphoid tissue,

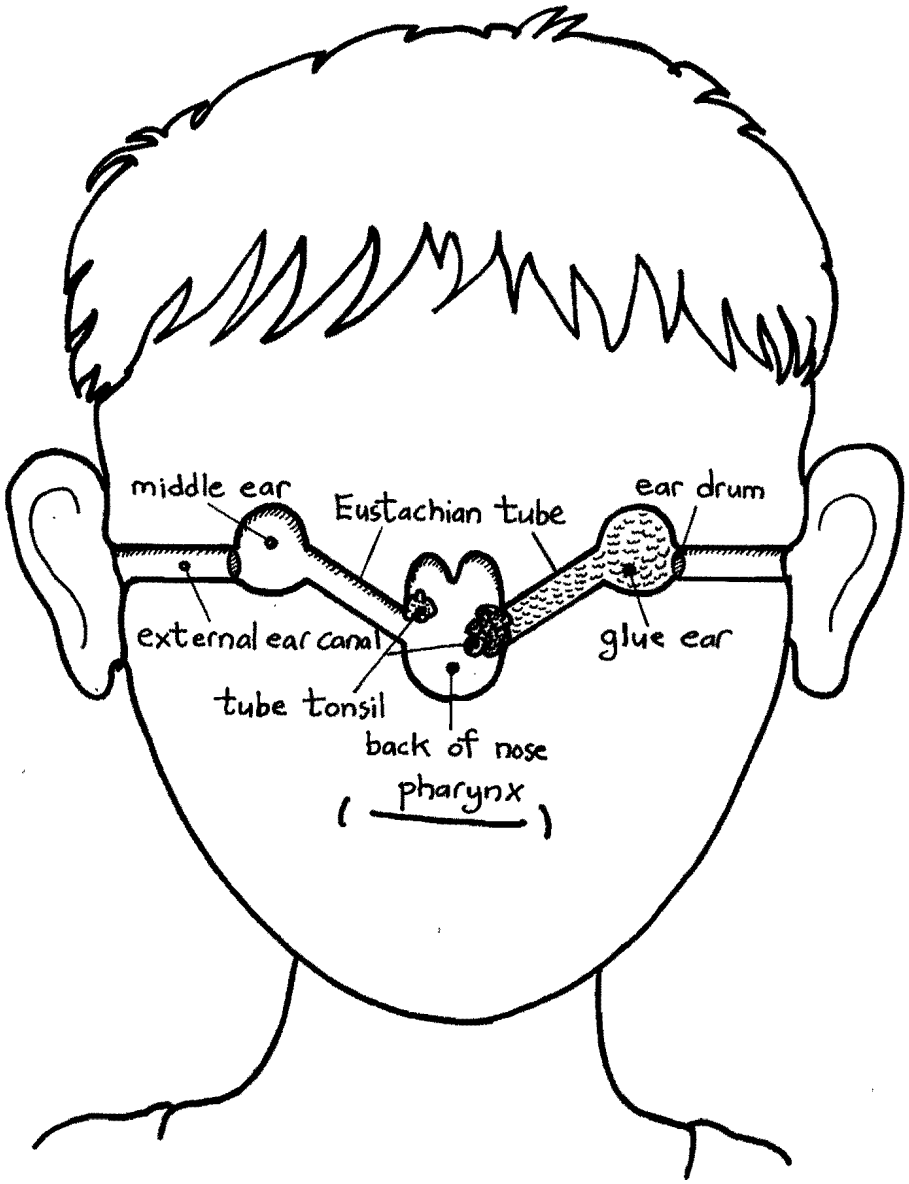

FIG. 8 Interconnecting structure of the middle ear and pharynx.

called the Tube Tonsil (FIG. 8). These tube tonsils are a part of the immune system. Their function is to prevent infectious agents from getting through the nose and throat into the Eustachian tubes and the middle ear. There is one situation when we feel the presence of tube tonsils very well. I am sure that everybody recalls that blocked ears feeling when flying on the aeroplanes. What happens is that the tube tonsils can get inflamed and swollen due to infection in your nose or throat or simply due to the plane's air conditioning. When the tube tonsils get swollen, they block the entrance into the Eustachian tubes. As a result the pressure inside your middle ear cannot be equalised with the changing atmospheric pressure when the plane is taking off or landing, which gives you that muffled hearing and pain in the affected ear. Swallowing, yawning, chewing, and holding the nose and mouth shut while gently trying to force air out of the lungs stretches the opening of the Eustachian tube and allows the air into the middle ear. But if the tube tonsils are swollen too much these measures usually don't work.

The Eustachian tube is the most obvious way for any infection to get into the middle ear. However, it is not so simple.

The mucous membranes of the Eustachian tubes are covered by ciliated epithelium and contain a lot of mucus glands and lymphatic follicles. Ciliated epithelium is a layer of cells with tiny hair on them. These hair are normally pointing away from the middle ear to the direction of the nasopharynx providing an effective barrier for any debris from food or air trying to get into the middle ear from the nose and the mouth. The numerous mucous producing cells in the walls of the Eustachian tubes are constantly cleaning the tubes up with their mucous secretions, which are moving along the direction of the tiny hair of the ciliated epithelium down into the back of your nose. In order for any infection to get into the middle ear it would have to struggle against this flow of mucous. But if any infectious agents do manage to get into the Eustachian tube, the lymphatic follicles in its walls, which are part of the immune system, will launch their attack and finish the invader off. And, of course, before the infection even gets into the Eustachian tube it has to pass the first barrier - the tube tonsil, which is a concentration of immune cells specially designed to stop any invader. This combination of factors provides a pretty formidable defence for the middle ear! In healthy children it works very well indeed. Why don't these defences work in so many children? How does the infection get through all these barriers? Why do we have an epidemic of ear infections and glue ear?

Here we come to a very important point. The mouth, nose, throat, Eustachian tubes and middle ear of a newborn baby are sterile. Fairly soon after birth the mouth, nose and throat get populated by a varied mixture of microbes, coming from the environment, mum, dad and anybody else, who is in contact with the child. Just as it happens with the gut, due to various factors which we have discussed, many children develop abnormal flora in that area. This will do two things. First - the epithelium of Eustachian tubes will start producing too much mucous in order to protect and clean itself. Second - the tube tonsils will be in a chronic state of inflammation, blocking the entrance into the tubes and not allowing the mucous to drain out. Fairly quickly the middle ear fills up with mucous. This situation is called the glue ear. Mucous will not allow appropriate passage of sound through the middle ear impairing the child's hearing and hence development. A lot of children with glue ear do not become autistic, for example, but their general learning abilities suffer. Speech delay is very common among these children. The mucous which fills their middle ear would provide a good growing environment for any infection which may come along from the back of the nose through the Eustachian tube. When that happens the child gets typical symptoms of ear infection - pain and fever, when antibiotics are usually prescribed. Antibiotics would clear away the infectious agent, but they would not remove the glue ear. In fact in the long run they make the situation worse by altering the bacterial flora in the nose and throat even further. So, with the middle ear still filled with mucous, a good medium for growing bacteria, predictably the ear infection happens again and fairly soon. Having suffered numerous ear infections, many children finish up with little pipes, called grommets put through their eardrum in order to provide another channel for draining the mucous from the middle ear. This operation is a symptomatic measure, but it usually resolves the problem of glue ear and stops the chain of constant ear infections. So, the epithelium of the middle ear and Eustachian tube will still be producing a lot of mucous and the natural channel for draining this mucous will still be blocked, but the mucous now will drain through an artificial pipe - grommet into the outside.

As we said, grommets are a symptomatic measure, a crutch in a way, which does not remove the real problem. The real problem is an abnormal flora developed in the child's nose and throat. Practise shows that when that flora is normalised, the glue ear and ear infections disappear. Two things have to be done to normalise bacterial flora in that area.

First - the diet should not provide food for abnormal bacteria. As we

discussed in earlier chapters these foods are sugar, milk and processed carbohydrates. It is amazing how quickly glue ear resolves when these foods are taken out of the diet.

A second important measure is adding a strong therapeutic probiotic to the child's regimen. The beneficial bacteria in the probiotic would help to clear out pathogenic flora and re-establish normal healthy flora in the mouth, nose and throat, which would keep the child clear from ear infections. To do that, apart from adding a probiotic to the food, I routinely suggest to the parents of children whom I see in my clinic to open a capsule of probiotic and put the powder on the child's tongue last thing before bed, after the child has cleaned his teeth and is not going to eat or drink any more. This way the probiotic bacteria will have a chance to work on the flora of the mouth and throat all night. As the back of the nose and the back of the mouth both open to the same place, the probiotic bacteria have a good chance of reaching the back of the nose, where the tube tonsils are, and deal with any pathogenic flora in that area. On top of that, the stimulation of the immune responses, which the probiotics produce, would also help to clear out any infection. As a result the inflammation would subside and the tube tonsils would resume their normal size and not block the Eustachian tubes any more, allowing mucous to drain from the middle ear. This will resolve glue ear and the constant chain of ear infections.

Another common contributing factor to ear infections are food allergies, particularly allergy to milk. In the previous chapters we have discussed what role the gut flora plays in the development of food allergies. With the use of diet and probiotics we can improve the state of the gut flora and the immune system in the child's body. Clinical experience shows that a lot of food allergies disappear as the gut heals. In the meantime it is a good idea to remove the foods, which the child may be allergic to, particularly cow's milk.

However, it takes time to change the child's diet and to establish normal bacterial flora in the throat. What do we do as an immediate response to an ear infection?

Unfortunately, a very common thing that happens is the prescription of antibiotics. It is a routine response of the medical profession pretty much everywhere in the western world. We have discussed in detail what antibiotics do to the bodily flora (in the gut, on the skin, on all mucous membranes, including the nose, throat and ears). Though the course of antibiotics would clear that particular ear infection, it would lay the ground for the next one to come. Apart from destroying the beneficial bacteria, antibiotics are usually given to small children in a syrup, which would provide

concentrated amounts of sugars and starches to encourage the growth of pathogenic microbes in the throat, many of which are resistant to the antibiotic in that syrup. As a result these pathogens start growing even while the antibiotic is being administered. Many children, whom I see, have another ear infection pretty much as soon as the course of antibiotic finishes. Unfortunately, in these cases children are put on a permanent antibiotic for many months, which would cause a very deep damage to the child's bodilyflora and immune system.

There have been comparison studies done, where one group of children with an ear infection was treated with antibiotics and another group received no treatment. The result of these studies was the same - there is no difference in the outcome of an ear infection after an antibiotic treatment or doing nothing at all.

So, if you leave a child with an ear infection without any treatment, he or she will recover just as well. However, there is no need to leave the child without any help. People treated ear infections very effectively for centuries with simple home remedies. Here are some recommendations.

1. If you can manage it keep your child indoors until the ear infection resolves itself. Keep.your child warm all the time. Put a knitted woollen hat on your child, and a warm jumper while indoors and let your child wear a warm hat at all times - during the day and at night.
2. Give your child plenty of hot drinks. Just hot water with a slice of lemon and a spoon of honey is sufficient. Sit your child on your lap andgivehim or her this drinkfroma teaspoon, taking great care not to burn the child but to let him have this drink as hot as possible. Put some probiotic powder on his/her tongue after finishing the drink. If it is difficult to get your child to take the powder, mix it in a teaspoon of warm water and give him this teaspoon straight after finishing the drink. Remember that probiotic contains live bacteria, which will be killed by hot water, so mix it with warm or cool water. Instead of just water with lemon and honey, you can make some herbal teas: camomile, calendula, marjoram, eucalyptus and thyme all have anti-inflammatory and antiseptic properties. Make sure that you get the pure herb itself without any additives. Put a teaspoon of the herb into your teapot, pour over boiling water, cover and let it brew for **5** minutes. Pour this tea through a sieve into a teacup, add some honey and give it to your child spoon by spoon. After finishing the tea, follow with the spoonful of probiotic powder on the tongue.

3, Take 1-2 tablespoons of cold pressed olive oil and mix in a crushed clove of garlic. Leave it for 30 minutes, strain through a sieve or cheese-cloth. Put a few drops of this oil into your child's ear every hour, particularly before going to bed. Keep this oil at a room temperature and warm it up slightly before putting into your child's ear. To warm this oil up, stand the cup with the oil in a dish with warm water (not hot though, as it will reduce the oil's effectiveness). Do not microwave this oil, as all the enzymes and other active substances in it will be destroyed. Every day make a fresh mixture. The fresher it is the more effective it will be. There are some commercial preparations available as natural ear drops, containing olive oil with some garlic oil, lavender oil, calendula and other natural herbs.

4. The old onion remedy. Take a large white onion, chop it up finely and wrap it into a piece of cotton cloth. Put it into a microwave and warm it up fairly hot but tolerable to the touch. Put it on your child's ear and securely cover with a warm hat (a soft woollen knitted hat is best). You can put a piece of cling film between the onion wrap and the hat, so the onion juice does not soak the hat. Keep it on your child's ear until it starts cooling down. Warm it up again in the microwave and repeat the application. This procedure is very relaxing for the child and is very good to do at bedtime. It is a bit messy and makes your child smell of onion, but works amazingly well. After this procedure keep the warm hat on your child and let him/her go to sleep on the side of the affected ear to keep it warm.

If your child run s a fever below 38°C (ioo°F), you do not need to reduce it. The fever is the body's way of fighting the infection. However, temperature above 38°C (ioo°F) should be reduced as it can be harmful. Unfortunately, all anti-inflammatory preparations for children are made with syrup, M1 of sugars and starches, which should be avoided. I recommend the parents to use Aspirin for children (if there is no allergy to Aspirin), which is very effective in reducing pain and inflammation. Get Soluble Aspirin in small 75mg tablets, dissolve half a tablet in warm water and give to your child as a drink with some honey. You can also dissolve it in his cup of hot herbal tea. Aspirin should never be given on an empty stomach as it may irritate the stomach lining. Let your child eat something first before giving him/her Aspirin.

Aspirin is a very safe medicine and has been given to children for decades until a very rare and obscure condition was described, called

Reye's syndrome. A whole host of drugs, pesticides and other chemicals can cause this condition. This association with Reye's syndrome has led to the withdrawal of aspirin from routine use in children in the USA and UK, though it is still used for many childhood rheumatic conditions. Consequently, aspirin got replaced by paracetamol for use as a painkiller and anti-inflammatory in children. Yet, paracetamol is far more dangerous a drug than aspirin will ever be. Because paracetamol is extremely bitter it has to be mixed with very concentrated sugary substances to disguise its taste. We know that children with GAP syndrome should avoid sugars. Aspirin has a very mild taste and is very easy to give to children. It is one of the safest and oldest medicines used for all inflammatory conditions. Apart from reducing inflammation and pain it will improve blood circulation in the body. As a result, quite often an administration of Aspirin relieves an ear infection very well on its own possibly by allowing the mucous to drain from the middle ear.

A caution: if your child has got any rare genetic condition, liver impairment or kidney impairment, always consult your doctor before using any medication, including Aspirin.

All these measures should be applied as early as possible. If after **2-3** days the pain and fever are not getting any better you may have to resolve to antibiotics. However, in the majority of cases these natural treatments work very well and the child recovers without any help from the doctor. In the meantime it is a good idea to start the long-term intervention (diet and probiotics) as soon as possible to prevent any future ear infections.

2. TOP TEN INFLUENCES, WHICH BOOST IMMUNITY

1. Cold pressed oils: olive oil, fish oils, nut and seed oils.
2. Fresh eggs, particularly raw egg yolk.
3. Onions and garlic.
4. Freshly pressed vegetable and fruit juices.
5. Regular consumption of greens: parsley, dill, coriander, spring onion and garlic, etc.
6. Probiotic supplementation and fermented foods.
7. Contact with animals: horses, dogs, etc. Having a pet in the family can do a lot for children's immune status.
8. Physical activity in the fresh air.
9. Swimming in unpolluted natural waters: lakes, rivers and sea.
10. Exposure to sunlight and sensible sunbathing.

3- TOP TEN INFLUENCES, WHICH DAMAGE IMMUNITY

1. Sugar and everything containing it: sweets, soft drinks, confectionery, ice-cream, etc.
2. Processed carbohydrates: cakes, biscuits, crisps, snacks, breakfast cereals, white bread and pasta.
3. Chemically altered and artificial fats: margarines, butter replacements, cooking and vegetable oils, processed foods prepared with these fats.
4. Lack of high quality protein in the diet from meats and fish, eggs, dairy products, nuts and seeds.
5. Exposure to man-made chemicals: cleaning and washing chemicals, personal care products, paints, fire retardants, petrochemicals, pesticides, etc.
6. Exposure to man-made radiation: electronic screens (TV; computers, play stations, etc.), mobile phones, high-power electricity lines, nuclear stations and nuclear wastes.
7. Drugs: antibiotics, steroids, antidepressants, painkillers, anticancer medication, anti-viral drugs, etc.
8. Lack of fresh air and physical activity.
9. Lack of exposure to sunlight.
10. Lack of exposure to common microbes in the environment. Living in a too sterilised environment is strongly associated with compromised immunity. The immune system needs constant stimulation from the microbes in the environment.

4. CONSTIPATION

Many GAPS children and adults, whom I see in my clinic, are constipated. Sometimes the constipation is very severe when the person cannot pass the stool for **5-7-10** or more days.

This is one of the common scenarios. A little boy J. would not have a stool for a week or so and then he would pass an enormous stool, screaming with pain. His mother described his stool passing as going through childbirth. The stool initially would be hard and large, followed by masses of loose or watery faeces. His anus would crack and bleed and as soon as these cracks began healing, the next stool would arrive in seven days tearing his anus again. The boy was obviously fearful of passing his stool and would hold on for as long as possible. This situation is terrible enough, but it is actually not as bad as the next common scenario.

A little girl B. has quite a good appetite and would eat and eat all day. But she would not pass any stool for **10** or more days. Then she would have a very small mushy stool, coming out in thin strips. This sort of stool is an over-spill, squeezed through masses of compacted faeces which will stay in her bowel for months or longer, poisoning this child. And indeed her learning disability was far more severe, than that of the boy J., who managed to empty his bowel, though only once a week.

Constipation is always a sign of deficient gut flora in children and in adults. Beneficial bacteria, normally populating the bowel play a crucial role in proper stool formation and elimination. The most numerous species of friendly bacteria in a healthy bowel are *Bifidobacteria* and physiological strains of *E.coli.* These microbes produce a whole host of enzymes and other active substances, whose action is essential in proper stool formation. They stimulate the wall of the bowel to produce mucous for lubricating the stool and for passing it out as soon as it is ready. A healthy person should have **1-2** stools a day.

GAPS children and adults do not have normal gut flora and that is why they often have constipation or diarrhoea. Populating their bowel with beneficial bacteria is the most important thing to do in treating constipation. In many cases the constipation gets resolved by changing the diet and giving the patient a therapeutic probiotic by mouth. However, in more

stubborn cases we have to take other action. Here we have to talk about enemas.

A lot of people in the West find the subject of enemas repulsive. And yet this safe and very effective procedure is probably as old as humans are. There is a whole chapter in *Manual of Discipline,* which was recorded two thousand years ago in the *Dead Sea Scrolls* describing in detail how to perform an enema and how beneficial it is for health. Another third century manuscript, found in the archives of the Vatican, called *The Essene Gospel of Peace,* gives a full procedure for performing an enema and strongly advises doing it as the "holy baptizing by the angel of water". Famous Arabian physician, Ibn Sina Avicenna in his timeless work *Canon Medicinae* in the nth century has advocated regular enemas to clear the body and soul. Regular enemas are an integral part of many natural treatment programmes for such serious health afflictions as cancer, psychiatric problems, autoimmunity and others. The enema kit is a common tool found in family bathrooms in many eastern countries, performed without any medical assistance or prescription on children and adults alike.

What are the benefits of enema?

- It is the most effective and quick relief of constipation.
- It is the most effective way to clear out faecal compaction from the bowel greatly reducing the amount of toxins coming from this putrefaction into the person's body.
- It is the best way to introduce probiotic bacteria directly into the bowel.

- It is completely safe, providing that it is performed correctly.

The enema procedure

You can get an enema kit from various health shops and health companies.

Boil 2 litres of filtered or bottled water and cool it down to around 40°C.

Prepare the enema. To do that assemble the enema kit and hang the enema bucket about a metre above the place where your patient is going to lie down. Fill the enema bucket with clean water, open the tap at the end of the enema pipe and let all the water flush out through the pipe. Close the tap and fill the enema bucket with your warm boiled water. Let some of it flush through the pipe to wash out any impurities. Close the enema tap.

In order to introduce probiotic bacteria direcdy into the bowel dissolve a probiotic in the remaining warm boiled water in the enema bucket. Use a

therapeutic strength probiotic with predominantly *Bifidobacteria* species in it and make sure that the enema contains at least **4-5** billion viable bacterial cells. Obviously you cannot use probiotics in a tablet form, as it will have fillers and binders and other additives. Probiotics in a powder or a capsule form may have a medium of maltodextrin or FOS, which are acceptable to use in enemas but not ideal as they may cause excessive gas production for a day or two. Pure probiotics without any additives are the best to use for enemas. If you can not find a suitable probiotic just use clean boiled water or a pure weak camomile tea (make sure that there are no other ingredients but camomile herb). A few tablespoons of home-made yoghurt added to the enema water can be very soothing for an inflamed or irritated rectum.

With a child make sure that you have an adult helper, who will either perform the enema or distract the child. You need to make this procedure as comfortable for the child as possible. Make a nice soft place for him/her to lie down underneath the enema bucket and not far from the toilet or have a potty ready. Have some favourite toys, books or a video handy to occupy him/her. Lie your child on the right side with bent knees close to his/her chest. Apply Aloe Vera gel as a lubricant on the nozzle of the enema and on the anal area of your child. It is a good idea to warm up the nozzle before doing the enema by placing it in warm water. Insert the nozzle into the anus of your child **1-2** cm deep and open the tap of the enema. As you positioned the enema bucket at least a metre higher than the child the water will flow by gravity through the enema pipe into the rectum. Initially **100ml** of water may be enough, later on you may use more water (up to one litre). The more water you can comfortably get in, the better cleaning will take place. Close the enema tap and take the nozzle out. Let your child lie on the right side for as long as he/she feels comfortable. The longer your child keeps the water inside, the better the cleaning will be performed. Your child will let you know when he/she is ready to go on the toilet or a potty. Let your child sit on the toilet for at least **10-15** minutes to empty his/her bowel completely. Occupy him/her with toys, books, videos or anything that works to keep the whole experience pleasant. It is particularly important to make the first enema pleasant, so your child will accept it next time without any apprehension.

ff you feel uncomfortable about performing the enemayourself for the first time, employ a nurse or a trained colonic therapist to do it for you. Never give your child an enema with salt or anything else apart from clean boiled water, water with probiotic, home-made yoghurt or pure weak camomile tea.

With an adult the whole procedure can be much simpler. The amount of water in the enema for an adult should be 1-2 litres.

After performing the enema you need to clean the enema kit by flushing it through with water. After that sterilise it by pouring 20-30 ml of 3%-6% Hydrogen Peroxide through it and hang it to dry with the enema tap open. You can get Hydrogen Peroxide in any pharmacy without prescription. If you cannot find it use any sterilising solution, suitable for baby bottles or other children's plastic equipment. You will need to wash and sterilise the nozzle separately.

A patient with persistent constipation should have a daily enema every night before bed, followed by a warm bath with one of the following: **V2-1** cup of Epsom Salt, sea weed powder, cider vinegar or sea salt. After the bath rub some Udo's oil, hemp oil, cold pressed sunflower oil, castor oil or cold pressed virgin olive oil on the skin of the abdominal area. These oils absorb quite well through skin and will help to relieve constipation in the long run. The whole procedure should be repeated every bedtime until the patient starts producing a regular stool on his/her own.

Of course, the diet, which we have discussed, is very important in re-establishing normal gut flora and normalising all functions of your patient's digestive system, including elimination.

I do not support the use of any laxatives, drug or herbal, particularly in children. They are designed to work on fairly healthy digestive systems. For a person with abnormal gut flora they usually are inappropriate. A combination of the diet and supplementation, which we have discussed, would relieve constipation in most cases. In those cases when it is not enough the enemas would do the job very effectively.

In conclusion I would like to say that GAPS patients whether it is a child or an adult should never be left constipated! Constipation is extremely harmful for the whole body. It lays the ground for all sorts of digestive disorders, including bowel cancer, and it produces a huge amount of various toxins, which poison the whole body. Diet and probiotics as a long-term treatment and an enema as an immediate remedy would effectively put constipation in the past for your patient.

5. GENETICS

The word genetics is mentioned a lot in connection with the GAPS conditions. Now and then we see articles in various journals where some part of some gene has been found, which may have something to do with autism, or schizophrenia, or ADHD/ADD, or dyslexia, or dyspraxia or depression. We are assured that scientists are working on it and that the genetic cause of these conditions will be found! Not that it will help the patients or their families, but it will put our minds at rest that our children were meant to be disabled and there was nothing we could do about it!

In our modern world genetics is a popular concept. Almost every health problem is commonly blamed on genetics. We pollute the water we drink, the food we eat, the air we breathe with industrial and nuclear wastes and when we get ill we blame it all on genetics. We deplete our soils of minerals and other nutrients and replace them with pesticides, organophosphates, weedkillers and lots of other chemicals, we grow our crops on these soils, we eat these crops, we get ill and blame it all on genetics. We damage our children's immune systems with vaccinations and antibiotics and blame it all on genetics. We regularly consume processed foods with virtually no nourishment for the body and full of chemicals, detrimental to health, and when we get ill we blame it all on genetics. We regularly intoxicate ourselves with alcohol, tobacco and drugs and when we get ill we blame it all on genetics.

If we look at all the epidemics of degenerative disease we have in our modern times, which are blamed on genetics, it is easy to come to the conclusion that we all must have very poor genetics indeed! In fact I don't know how human kind survived for millennia with such poor genetics! According to the scientific establishment genetics are to blame pretty much for every misery we suffer. We have epidemics of cancer, heart disease, diabetes, psychological and psychiatric maladies, learning disabilities, autoimmune disorders, obesity, etc. etc., the list is very long. These are all conditions which doctors very rarely encountered too years ago. Have our genetics changed so quickly to cause these epidemics?

Well, for the last few decades genetic research or molecular biology has received the most money in the western world. A lot of laboratories, which used to do basic science, have been converted into genetic research. Billions have been poured into this area in every western country. So, if every other scientist works in genetics then that is what they know and that is what they are going to think about when it comes to identifying the course of any disease. As the old English proverb states: "If the only tool you have is a hammer, then everything looks like a nail." Obesity? Don't worry about your eating habits. Just wait, we will find a gene to blame for it!... Cancer? Do not torment yourself with questions about your life-style, we will pinpoint a gene which caused it!... Learning disabilities? Oh, definitely must be genetic!

Before the discovery of *Helicobacter pylori* the medical professionals talked a lot about genetics causing stomach ulcers, gastritis and stomach cancer. When the *H. pylori* was discovered and it was proven to cause stomach ulcers, gastritis and stomach cancer, nobody talks about genetics anymore in connection with these disorders, because the real cause has been found. This example shows just how easy it is for us to blame things on genetics in order to fill a gap in our knowledge.

Genetics are a very convenient scapegoat. It is something we are born with, there is nothing we can do about it at the moment. So, wouldn't it be wonderful not to worry about our food, environment or our life-styles? Wouldn't it be so convenient to just put all the responsibility for our state of health on our genetics?

Fortunately, life is not that simple!

Of course there are clearly identified genetic conditions, like phenylketonuria, haemophilia and many others, where specific faulty genes have been discovered. However, these conditions are relatively rare, their incidence is fairly stable and they are not the main concern in the modern world. The real problem in our modern world are the epidemics mentioned before of cancer, heart disease, autoimmune and psychiatric conditions, learning disabilities, diabetes, obesity and many other modern maladies, where the numbers of sufferers are growing at a rapid pace. Despite huge amounts of money spent on genetic research, none of these conditions had any clear genetic causes allocated to them. A number of different genes are thought to have something to do with them, and the more research is done the clearer it becomes how unclear it all is. GAPS conditions are not an exception. Number of research studies have been published here and there, where scientists suspect different genes, but there is

no conclusive evidence for any specific gene or combination of genes which we can blame for these disorders.

As with other modern epidemics, there is a conclusion that there may be a genetic predisposition to the disorder rather than a genetic cause. This predisposition can be made of tens or even hundreds of various genes, how many and in what combinations - nobody knows yet. But what we do know is that any predisposition to materialise into a disease has to have certain environmental conditions, in other words things that happen to us after we are conceived. Diet is a major part of this environmental conditioning.

Let us have a look at studies on identical twins. Identical twins are two people who have the same genetics and consequently they should have the same predisposition to the same diseases. However, there are many studies showing that when identical twins are separated at an early age and live in different environments with different diets and life-styles, they do not develop the same health problems at all. Even in schizophrenia, which is commonly perceived as a "genetic" disease in **50-60%** of identical twins, only one twin develops schizophrenia.

Studies on ethnic emigration also confirm the fact that in the majority of cases environment, specifically diet, is more important than genetics. For example, Chinese people, who live in China, are generally shorter than the western population. However, Chinese people who were bom and grew up in western countries are generally as tall as westerners. Western diet is obviously a more important factor here than genetics.

To make the matter even more interesting, there is a large body of research showing that maternal diet during pregnancy and the diet of a baby have a major impact on the genetics of that baby. Apparently there are many genes in a child, which never become active. For a gene to become operational it has to have certain conditions to express itself. Depending on the diet of the mother during pregnancy and the diet of the infant after birth different genes will get expressed. This process does not stop at the infant stage. Throughout our whole lives our diet has a profound influence on gene expression, in other words what we eat changes our genetics. So, which is the chicken and which is the egg - genetics or the environmental factors?

Environment: our diet, life-style, pollution, stress, infections, etc., has a profound effect on what would happen to the child's health since conception. The same environment will shape a lot of the genetics of the child. Genetics is a very complicated area and despite all our investment into

molecular biology we are still very far away from a full understanding of the role genetics may play in our health. What the science learned so far we can't put into practical use, in other words there is nothing we can do with our genetics directly. But, there, is a lot we can do with our environment! By changing the environment (diet, life-style, etc.) we can make sure that whatever genetic predisposition the child may have, this predisposition will not develop into a disease, and at the same time we can alter gene expression with the correct diet which will indirectly improve our genetics.

Another aspect of GAPS conditions, where genetics are usually mentioned, is a family history; In almost every family with an autistic child, for example, there is a history of autoimmune disease and digestive problems. Routinely it is assumed that if a mother or a grandmother had asthma, arthritis, lupus or any other autoimmune disease, then the immune imbalances the child has got, must be genetic. There are two factors here that are usually overlooked.

The first one is the gut flora. The gut flora with its unique composition is passed mainly from the mother to the child. Let's look at a very common scenario. If a maternal grandmother of an autistic child had an abnormal gut flora, which resulted in arthritis in her case, she passed this flora to her daughter. Quite commonly for her generation she opted not to breast feed her daughter, because it was not fashionable at the time. This deepened the damage to the gut flora of the daughter, who developed asthma and eczema and/or a digestive disorder as a result. In her generation most girls were put on a contraceptive pill from late teens for quite a few years before they had children. The pill would alter her gut flora even further. Then she has a child, to whom she passes her deeply abnormal gut flora to. This child develops autism.

In the previous chapters we have looked in detail at how abnormal gut flora would cause autoimmune disorders. Whether genetics may play a role in passing these immune abnormalities to the next generation, the science has yet to demonstrate. But, rather than assuming that it is genetics, let's not loose sight of a proven and significant factor, passed through generations, the gut flora.

Another familial factor, which is often overlooked, is learned behaviour. What is a learned behaviour? These are all the things that children learn from their parents, daughters from their mothers: what to eat, how to cook, what foods to choose from, personal values and priorities. These learned behaviours can vary quite dramatically from family to family. This is something being passed through generations without any genetic involvement.

But it is as important as genetics if not more so, because it will alter the gut flora, the pH, the metabolism and the biochemistry of the body. And if the grandmother, daughter and granddaughter follow the same family behaviour then they will predispose themselves to similar health problems. For example, imagine a family where rich sugary deserts were always a tradition, a lot of bread, pies, biscuits and cakes. This diet will alter the gut flora and promote an overgrowth of pathogenic microbes in the gut, which always has an unbalancing effect on the immune system. At the same time it is a very house-proud family, a lot of cleaning and polishing with domestic chemicals, air fresheners, deodorants, a lot of personal care products and perfumes - all highly allergenic and toxic substances - another onslaught on already compromised immune systems. We did not come even close to genetics here, but already you can see how the family can make you immune-compromised simply through learned behaviours.

In conclusion: it is possible that there are some non-specific genetic predispositions to autism, schizophrenia and other GAPS conditions, which quite likely overlap with a predisposition for autoimmune and digestive disorders and some weakness in the blood-brain barrier. It is very likely that this predisposition is very widespread and modern environmental factors make it materialise into disease much more often than **100** years ago, when the environment was different. A century ago people may have had this predisposition just as much, but it did not show itself because the environment for it was not right - the diet was more natural, less pollution, less stress, no vaccinations, no antibiotics, contraceptive pills or other drugs, no nuclear contamination and many other factors. One hundred years ago the majority of doctors would never see autism in their practice, for example. Today we have a growing epidemic of autism. Genetics just don't work this way. This epidemic can only be due to environmental factors: modern diet, life-styles, vaccination, drugs and pollution.

Rather than dwelling on genetics, which we can do nothing about, I see this conclusion as positive, because there is a lot we <u>can do</u> to change the environment to help our children. And those who have done so know that it works!

6. A FEW WORDS ABOUT EDUCATION

I have probably learned more in the first five years of my life than during the rest of it

Leo Tolstoy

Education of GAPS children is a huge subject. It is beyond the scope of this book to cover it in detail. However, it is important to make one point clear. I have seen many parents in my clinic who have put a lot of effort into the physical side of their child's disorder but did not do much in terms of organising their child's education. These children usually do not do as well as the children who had both issues addressed at the same time.

From the moment children are born, what do they do most of the time?

They learn!

Every moment, they are awake, they learn from the environment, from the people around them how to communicate, how to behave appropriately, how to play with toys appropriately, how to play with their peers and later on, as they go to school, they learn how to acquire academic skills. This is one of the most important abilities we human beings are born with - to be able to learn in order to survive and to fit in the world.

A normal child learns from the moment it is born. Have you ever observed babies and toddlers? They are like little sponges, listening to everything, watching everybody around them, absorbing everylittle bit of information from their environment and learning, learning, learning. Their brain cells develop very vital connections and circuits, which would serve these children for the rest of their lives.

GAPS children miss a lot of this learning. Due to their toxicity their brains are not able to process information properly, so these children are not sponges in those very important first formative years. They have normal ears, eyes, taste buds and sensors in their skin. But all the information these organs receive is then passed to the brain to be processed. A brain clogged with toxicity cannot process this sensory input appropriately, so GAPS children may not hear, see, taste or feel the same way a normal child would do.

Highly functioning autistic individuals, who lecture about their disorder, tell us that they cannot hear certain frequencies, that certain sounds hurt

their ears, that they may not hear parts of words said to them or hear them in a distorted way. They say that they cannot see certain parts of the light spectrum, some parts of written words, they get lost or disoriented in fractionated light, for example the shadow of a tree or flickering electric lights, some parts of light spectrum hurt them. They describe touch from certain fabrics and people's hands as unpleasant as the "pins and needles" feeling we can get after sittinguncomfortably. A lot of these autistic individuals say that many foods taste bland for them and the texture of the food can be offensive. All the sensory input from eyes, ears, skin and mouth turns into a jumble in their heads, disorienting, sometimes pleasant, sometimes unpleasant and sometimes frightening. That is why these children develop all sorts of behaviours which look bizarre to us, but would probably make perfect sense if we took into account what happens to the sensory input in their brains. Their brain cells do not develop normal connections and circuits. Instead they develop abnormal brain cell connections and circuits. Some of these circuits show themselves as self-stimulatory behaviour or self-destructive behaviour.

Depending on the severity of the GAPS condition this abnormality in processing sensory input may range from an absence of speech development in an autistic child, for example, to very slight abnormalities in semantics and pragmatics of the language, commonly seen in ADHD/ADD and dyslexia. Many dyslexic children may not show any obvious problems with processing sensory input until they need to learn reading and writing. However, looking back parents of these children would describe other sensory issues, like unusual fears of certain sounds and objects, strange taste preferences and fussiness with food, unexplained tantrums and unusual play routines. Children with ADHD/ADD, apart from their behavioural problems, almost without exception have deficits in pragmatics of the language, which may not be obvious to parents, but can be identified on testing. These are the finer points of the language development concerning conversational skills, answering/responding, greeting, informing, naming, labelling, negotiating, reasoning, etc. This language deficiency leads to problems in social skills and learning.

In the case of severe GAPS like autism the longer this situation goes on for the more normal learning these children miss and the more they fall behind their normal peers. Normal children never stop learning, so for an autistic child to have any chance of catching up with them he or she has to learn at double speed. The earlier this intensive learning starts the more chance there is for an autistic child to catch up simply because he or she

misses less. The older the child is the more he or she has missed out and the more he/she has got to catch up on. Apart from learning all the normal things the teaching has to undo all the abnormal patterns and behaviours the child has developed. Again, the older the child the more difficult it becomes to break abnormal brain cell circuits and build normal ones. So there is a definite sense of urgency for parents of newly diagnosed children in starting appropriate education as soon as possible.

The question is - what education?

Let us start from autism, as these children are at the most severe end of the GAP Syndrome.

Helping an autistic child

I would not attempt to describe here all the existing methods of educating autistic children. There are many of them and you can find many sources of information on this subject. Some methods aim to create an artificial environment to suit the child's needs. Other methods try to change the child in a way that he or she can fit in the normal world and lead as normal a life as possible. At the end of the day it comes down to parents, their abilities and determination, to what method is chosen.

However, no matter what method is chosen, any educationalist with experience in teaching autistic children would agree, that to be able to achieve the most, an autistic child needs **one-to-one teaching.** This teaching has to be **intensive** and very **structured.** It cannot be just any teaching. It has to be **conducted by specially trained people.** Every skill has to be broken into the tiniest possible steps, manageable for an autistic mind and taught step by step making sure that all the previous steps are solidly learned and used by the child. A normal child would learn every minute he or she is awake, so the teaching has to go on for **as** many **hours a day as possible,** every day. And we must not forget the sense of urgency if your child stands any chance of catching up with the same age typically developing children. Those children are not standing still in their development, so the goal post is constandy moving. There is not a moment to waste. I personally know only one method, which can achieve all that.

This method is Behaviour Modification or Applied Behaviour Analysis (ABA). Based on behaviour modification principals a very effective teaching programme for autistic children was developed by a Norwegian psychologist Dr O. Ivar Lovaas and his colleagues at the University of California in Los Angeles (UCLA). Dr Lovaas started his groundbreaking

work in the **1960s** and the programme is still evolving. It is the only programme for autistic children in existence, which has got solid published scientific basis behind it. The initial study on the efficacy of this programme was done by Lovaas and his team. It produced an astonishing result: **47%** of children completing this programme achieved normal intellectual and educational functioning with normal range IQ scores and successful performance at mainstream schools. Another **42%** were mildly retarded and went to special classes for the language delayed, and only **10%** were profoundly retarded and assigned to classes for autistic children. In contrast, only **2%** or the control group children achieved normal educational and intellectual functioning; **45%** were mildly retarded with language delay and **53%** severely retarded and placed in special schools for autistic and retarded children. The treatment group received forty hours a week of intensive one-to-one behaviour modification teaching, the control group received ten hours a week of one-to-one teaching. The children started the treatment before the age of four and the programme lasted for at least two years. The results of this study were published in the *Journal of Consulting and Clinical Psychology in* **1987.** Since then this study has been replicated in many other universities, mainly in the US, with similar results. All these studies concentrated on children under the age of five. Based on that for many years it was a general understanding that ABA can only be done with small children. However, in **2002** Dr Svein Eikeseth and his colleagues published results of their study, which demonstrated that older autistic children, aged from four to seven could make large gains with intensive behavioural treatment. In parallel with that there are several articles published mainly in the *Journal of Applied Behaviour Analysis* which show that the ABA programme works not only for children but for adolescents and adults with autism, though there are no formal studies published yet.

So, although developed initially for small children with autism the ABA programme can be effective with all autistic individuals - children and adults. However, one point still remains - the earlier you start this programme the better results you can expect.

As one of the parents, who was doing the ABA programme with her autistic boy, put it: "It is amazing how powerful this method of teaching is! With this programme you probably can teach a hippopotamus to speak and behave properly!" Whether you can teach a hippopotamus or not I don't know, but in combination with appropriate nutritional management the ABA programme has shown an ability to achieve the best outcomes for autistic children.

An example: From "Entering the world of autism: a mother's story" by Carolyn Lewis (you can read the full story in the book: "Treating Autism. Parent Stories of Hope and Success", edited by Stephan M. Edelson and Bernard Rimland, **2003.)**

Apart from nutritional intervention Brian had the ABA programme running at the same time.

"Brian's ABA program began August **1,2001.** I'll never forget that weekend because he cried and had tantrums for much of the three-day workshop. I was drained by the end of the third day. The only thing that kept me from breaking down was the hope that this program would pull our son out of the world of autism. His first task was to sit quietly on a chair for approximately five seconds. As he didn't want to do this, all of his crying and tantrums were in protest. Actually, this was a lot to ask of him, but it was the key to getting him into a teachable setting."

"Now Brian looks forward to each session of therapy, and he even hand-leads the therapist to the therapy room."

"Fifty percent of his time in therapy is play, and he gets much reward from success and the interaction with his therapists. Some have criticised ABA because they believe it 'kills the spirit'. I believed in the beginning, and still believe now, that without ABA we may never have known Brian's spirit.

Brian's daily schedule is full, and I am much more homebound than before ABA started. We schedule six hours of therapy a day seven days a week in our home. We plan two three-hour shifts of therapy each day. We allow time for naps, meals, and playtime between sessions. It is not always perfectly regimented, and I use the times when therapists can't make it to spend time in new adventures with Brian and Rachael." (Rachael is Brian's sister)

"Brian now (March **2003)** behaves much like a typical three-year-old. His eye contact and his facial expressions are normal. He plays with other children and toys appropriately. There are a few social quirks that need to be worked out, but I believe the pre-school environment and playing with typical children more often will address those issues."

"He has come so far in the short period of intervention that many of us who see him and work with him cannot help but comment on how many ways he has improved. Brian is a loving, affectionate, playful little boy who prefers to interact with others instead of watching TV. Brian has acquired many skills including pretend play, and he is a practical joker. He is speaking in sentences and will request what he wants with the appropriate words. He points to and comments on things. He has mastered many

programs in his ABA therapy. He likes animals and can make many animal sounds, Brian especially loves trains, cars, and aeroplanes. He also enjoys frequent trips to the pet store, and he plays with the neighbour's Boston terrier. Brian is no longer a stranger in our house, and he gives love back to us in so many ways. Brian is a miracle beyond belief to those of us who knew where he used to be."

Helping children with other GAPS conditions

Behaviour modification is a corner-stone of helping hyperactive children as well. Parents and teachers alike have to be trained in this valuable technique in order to provide consistent and structured help to an ADHD/ADD child. To learn in detail about how best to educate and handle a hyperactive child I would highly recommend two books by Sandra Rief *The ADD/ADHD Checklist* and *How to Reach and Teach ADD/ADHD Children.* Parent and teacher training, language therapy, work on social skills and many other aspects have to be addressed in order to help a hyperactive child.

As a result of abnormalities in processing sensory input GAPS children often do not develop normal social skills. So, making friends and sustaining relationships becomes a problem. If these problems are not addressed then through the years the child's self esteem suffers. Feeling rejected for years may create withdrawal or vindictive and anti-social behaviours. Working on speech and language pragmatics with a qualified therapist is partly important in addressing this problem. However, in parallel there is a lot the parents can do to help their GAPS child in developing good social skills. I would highly recommend a book and a manual by Myrna B. Shure *Raising a Thinking Child.*

Children with GAP syndrome are eligible to receive a lot of professional help: speech and language therapy, occupational therapy, psychotherapy, special teaching, etc. However, the most important people in children's lives are their parents. So, it is the parents that have to be the main therapists for GAPS children. Behaviour modification is the most practical and sensible way of bringing up a GAPS child. I believe that parents of all GAPS children need to be trained in this valuable method. It allows mom and dad to deal with their child'sbehaviours in a positive, constructive and effective way, which brings a lot of normality into their family life. We are not trained to be parents. Most of us have no idea how to bring up a child before our first bundle of joy arrives into our lives. Lucky are those of us who are

blessed with a healthy, happy and compliant child. Unfortunately, in the case of GAP Syndrome parents are blessed with just the opposite. To bring up a child like that you cannot just rely on parental instincts. You need to be specially trained! Behaviour modification works on the common sense premise: the way the parent responds to what the child does will shape that child's behaviour, Untrained parents unintentionally reinforce their children's bad behaviours by the way they respond to these behaviours. At the same time these parents unintentionally ignore good behaviour which does not encourage the child to repeat that good behaviour. As a result the child finishes up with a whole bunch of unpleasant and irritating habits which then receive negative attention from the parents. The child-parent relationship deteriorates to non-compliance, reprimands and punishments. Both sides suffer and the family life becomes a struggle. Being trained in behaviour modification makes you an effective parent. Effective parents have happy children and build happy families.

In conclusion: children with GAP Syndrome have to receive very targeted education from trained people, including trained parents. In those cases where children receive this kind of education the outcome is much, much better, than in cases where children's education is left to chance.

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