

Rustam Akhmetov
GROWTH:
D genetics or aspiration?



CONTENT

Introduction	5
A bit of history	7
Interesting facts about growth	12
Low people can sleep peacefully - they were acquitted	22
Growth forecast	28
The race of giants	33
About growth from the perspective of modern science	39
High growth and genius	50
Violation of p hundred and the fight against him	51
Some anthropological definitions	68
Age-related dynamics of the body sizes of children and adolescents	71
Morphological characteristics of total and partial body sizes during the growth period in both sexes	78
Problems of sports anthropology	92
The interaction of heredity and the environment in the process of regulating the growth rate	104
Acceleration. Causes, signs, methods of determination	105
Races and environmental conditions	114
Facts against growth hormone therapy	118
Learn to rule yourself	127
The magical power of exercise	142
Jumping - "pantry growth "	175
Can I grow up right away?	184
Make friends with swimming!	194
More about growth and nutrition	205
Massage and self-massage	215
If you want to grow up - temper!	224
How to sleep ..	232
Once again about stress	235
Conclusion	24

BBK 75.0 UDC 796.015 A95

Reviewers: LV Volkov - Doctor of Pedagogical Sciences, Professor;
VO Zaporozhanov - Doctor of Pedagogical Sciences :, Professor; LP
Sergienko - Doctor of Pedagogical Sciences, Professor

Akhmetov RF A95 Height: genetics or aspiration? : Monograph.

Russian. - Zhytomyr: Kind. OO Svenok, 2016. - 244 pp. : ill. ISBN

978-617-7265-68-8 Book by RF Akhmetov - Master of Sports of

International Class from High Jump, Doctor of Science in Physical

Education and Sport, Professor, Head of the Department of Theory

and Methods of Physical Education of Zhytomyr State University

named after Ivan Franko - tells about the reasons for the delay of

human growth and the possibility of their elimination. The author,

based on many years of research, practical experience and materials

of leading specialists in the field of medicine, hygiene and

psychology, proposes his own method of bleaching body length.

Practical recommendations, tips on mastering the techniques of self-

improvement, self-control, tempering and rational nutrition are

presented for those who want to grow their height. The book is

offered to a wide range of readers. UDC 796.015

Akhmetov Scientific Edition Rustam Fagimovich Growth: Genetics
or Aspirations? Monograph

Printed from the original layout of the author Signed for printing

30.05.16. 60x84 / 16 format. Mind. printing. Ark 14:18. Voocat

Oishi 81ule headset. Substitute No. '179. 500 copies. Publishing and

printing OO Svyonok Zhytomyr, vul. M. Berdichevskaya, 17-th tel. :

(0412) 422-106, e ipai: 2I_slгик@1.ua Certificate of entry of the

subject of the case in the State Register of Publishers, Manufacturers

and Distributors of Publishing Products of Ukraine series DC No.

3544 dated 05.08 .2009

IZVI 978-617-7265-68-8 © Akhmetov R. F., 2007. 2013, 2016 © O.

O. Svenok, 2016 edition

HEIGHT

Height is the concentration of will, And,
believe me, it is not at all simple. The height
of human pain, Returns to sport - height.
And the desire to go up into the unknown
will prove to everyone: look, I'm growing.
Conquering Everest is also a leap
in height.
And in any, even everyday business, People
have a big dream - The height of achieving
the goal, Overcome yourself height.

Yaulfo always loves
something inaccessible to you;
1. Gorytsiy

INTRODUCTION

The letters that I began to receive after publications on my system for increasing growth appeared on the pages of newspapers and magazines prompted me to start writing this book. Desperation and hope are merged in these letters: "Help me grow!" Here are typical cases: "I'm already 16 years old and I'm only 152 cm tall. Are there really no exercises that would accelerate growth?", "I am the smallest in the class, and they laugh at me ", " My height is 168, this is not enough for a good basketball player, "" I dream of becoming as big as my father, "" Acceleration is for everyone, and I am small. Is this fair? ", " I love one girl very much, and she is taller than me. Help! ", " My husband and I are tall, and both children (son and daughter) were born and grow up "small." I take this calmly, but my husband is angry that the children are not in him. The pediatrician says that the children are normal, and can't explain why to neither the mother nor the father. If this is genetics, then why is it so manifested? The husband has been playing sports with his son for a year, but he did not grow faster. One coach advised giving his son growth stimulants, he says that they are harmless to health, but we are afraid! To whom should we turn to examine children and prescribe medications necessary for growth, if it is harmless? ""^

At first glance, this may seem strange, because body length does not apply to indicators that are of vital importance. Nevertheless, interest in growth is not raised by chance. It has long been associated with health and physical strength. Normal growth has always been equivalent to the idea that a person with health is all right. The higher the person, the lower the risk of heart failure. This conclusion was made by scientists of Boston. Men taller than 170 cm are more susceptible to heart disease than those who are at least 15 cm taller. For the former, the probability of illness is 70 percent, and every 2.5 cm of growth reduces this probability by 3 percent. This book is addressed primarily to young people. However, many of the information and advice set forth in it can be used by people of advanced age. The proposed system for increasing growth is based on our own many years of experience, as well as on the materials of specialists in the field of medicine, hygiene and psychology. It is quite affordable. Practically everyone who is not forbidden by doctors to engage in general physical training can apply the advice. The proposed physical exercises can be performed always and everywhere - even at school during breaks, during breaks at work, on vacation, with friends, during classes with any form of mass physical culture. They are effective in the classroom but in various sports. The duration of classes is chosen by the students themselves, depending on their condition and mood. Everyone can be convinced of accessibility and benefit of our technique on their own experience.

A LITTLE HISTORY

I was eleven years old. I walked around my native Berdichev, and the noise in the stadium caught my attention. It turns out that there was a championship in jumping among schoolchildren. Before my eyes, Valery Skvortsov, a famous athlete in the future, overcame the bar at a height of 1 meter 95 centimeters. Skvortsov's jumps just struck me. I was thrilled, shocked. That night I couldn't fall asleep, I imagined everything: "I wish I could jump like that myself!" And I firmly decided: I should enroll in a group for high jumps at all costs. The next day, he joined the group of a well-known trainer, honored trainer of the Soviet Union Vitaly Alekseevich Donskoy, but he did not take me at first. Probably too small then. I had to wait a year. And finally, the day came when I got to the school of jumpers. Now I understand how lucky I am: it was my fate that decided. I began to go to training, I was happy - not to pass it, then Lonsky said that usually newcomers are somehow shy, do not know what to do, go idle, and I immediately set the bar in my corner, put down the mats and jumped. I'm jumping all the time, jumping ... My results started to grow rapidly. When he joined the group, his personal record was 1 m 20 cm, and after a year already 1 m 75 cm - the second adult category. But there's a hitch. Good two years - not a single centimeter of increase to achieve, all my peers have already overtaken me. How I grieved! Well, he did come to despair! In the end, he decided to ask Donskoy: why is this happening that I can't jump higher? And he answers me: "You know, you are small. Growth did not come out. You just need to grow up to jump higher ... "(and at that time I was 164 centimeters tall. And I have not grown for two years). Then Lonsky says: "You know what, write a receipt that you undertake to grow by eight centimeters per year. And you will grow up. And how can you not grow if you gave a word ?! "

Arriving home, after talking with the coach, I did so. He wrote the following commitment: “I, Rustam Akhmetov, undertake to grow by eight centimeters within a year. I swear to achieve this with all my might! ”And in a most prominent place he hung. It should be said that the opportunity to grow in me instilled faith. I gave my word to the coach! And the authority of Lonsky was indisputable for all of us. If he said, then it will be so! Here is one example. Once Lonsky took me to his home, and he has a large garden and a lot of black currants. He led me to a bush and said: “Eat. These are vitamins. For an athlete, this is very useful. But you have to thoroughly eat the bush. Without this, do not come to my section anymore. ” He went into the house, and I went to the bush - such a huge bush, all covered in berries. Forty minutes later, Lonsky came up and found me in a half-faint state. And, despite this, I, without even thinking anything, still pushed the currants into my mouth. He was even frightened and said: “What are you, how can that be? I’ve joked! ”Since then I have currants and do not eat anymore. So, believe me, when I wrote the receipt, I was convinced that I had to grow. Yes, and the receipt itself gave me the key to knowing how to grow. I was looking for material in libraries, I was interested in experienced people. In general, I collected information and summarized. Having learned that jumping annoys growth zones, I began to jump first a hundred, and then two hundred times a day. Wherever I am and no matter what I do, I jumped. On the way to the music school I tried to get all the leaves on the trees. I didn’t walk calmly at breaks. As soon as the bell rings, and I’m on the street: jump, stretch and jump again. If the daily norm is two hundred jumps, I did not have time to complete it, I jumped at night. And so as not to be afraid to go out, I asked my mom or sister to go out with me. Regularly on a special system slept stretched with rubber bands. Hanging on the Swedish wall and the crossbar, playing basketball, swimming in the pool (at

after all, the whole breast is stretched out), in the pool I came up with a lot of exercises aimed at increasing growth. Waking up in the morning, he never abruptly jumped up, and lay for several minutes doing sipping exercises. Then he knocked on the wall of the neighbor Aunt Nonna, who came to us and, along with my mother, pulled me by the legs. There was a laugh! They pull, and the bed moves around the room. I visited the homeland of my parents - near Kazan. There I was interested in what popular beliefs, legends are about how to grow. After all, the problem of growth worried my ancestors. Here is one of the favorite exercises that I used in my system. Its essence is that if a person wants to grow up, it is necessary to lie on his back and stretch very much, and at this time someone from very close people whom you love or whom you trust (mother, father, brother, sister, etc.), they should stroke the fingertips in the area of the solar plexus clockwise, and at the same time sentence the following sounds: "VC, VC, VC ..." (grow, grow, grow ... - Tatar.). Usually my mother stroked me. This exercise is pleasant. After its implementation, I felt that my growth was increasing. And one more exercise of our ancestors. To do this, you need to use a slide or other elevation. Such a slide was near my house. I climbed up, lay on my back stretching out and rolled down. At the same time I imagined that I was stretching like a dough. In my cultivation, I paid a lot of attention to such an important detail as nutrition. What I just didn't eat: I drank fish oil, carrot juice, and various dairy products, and a variety of vegetables and fruits. In a word, all that contains a lot of vitamin A, which helps increase growth. So gradually I developed my own system, which included my favorite exercises and complexes

feces, self-hypnosis techniques, as well as balanced nutrition. And the result of such fruitful work was truly fantastic for me - exactly one year later I grew eight centimeters! The question arises that all this, perhaps, happened naturally, and I would have grown up myself, without bothering myself with various systems for increasing growth? But I can't give an exact answer, but I'll just note that I haven't been growing for two years already, and only painstaking work on myself has generously rewarded me. I kept the word given in the receipt - it grew by exactly eight centimeters per year. But my story is far from over. He approached Donskoy with his result, and he says: "Well done! Write another receipt — again by eight! "Another year passed and, as the reader obviously guesses, I grew by as much as it was on the new receipt using my system. When I decided to write the third receipt, Lonsky suggested that too high is also bad to be. Our famous Valery Brumel has 185 cm, and this growth was considered ideal for the jumper. That is why I wrote the third receipt with the obligation to grow by 5 centimeters. A year passes - stretched exactly five. And then my trainer and teacher Lonsky said that no more receipts should be given, and that now I will jump, he is firmly convinced of this. Then the following words followed: "Do you want me to write a receipt myself, that you will jump high?" And I answered: "Thank you, because I already believe in you ...". And yet, after this conversation, over a year I added two more centimeters, by inertia. So I got 23 centimeters taller. Around this story there was a lot of talk, judgment, and commentary by specialists. So, Doctor of Medical Sciences, Professor of the Research Institute of Age Physiology B.A. Nikityuk believes that among the factors that influenced my growth, a great deal

physical exercise as such. In his opinion, any physical exercise, intensifying metabolic processes in the body, thereby contributing to an increase in bone mass during the growth and formation of a young body. The load, which is dynamic and pulsating, has a particularly pronounced effect on bone growth. Hops, repeated hanging, jumping, stretching, swimming - all that samples are just such a load. Therefore, with prolonged exposure, it certainly had to affect growth. The professor does not exclude the possibility that the desire to grow, through nerve factors, affected the endocrine system, on which the increase in body size depends. Assessing this factor, the professor wrote: "As a result of a complex impact (first of all, a special training system and a powerful psychological attitude), Rustam Akhmetov managed to add 23 centimeters to his height in a hopeless, seemingly genetic situation. But this does not mean that he broke his genotype, went beyond the inherited. I think that Rustam managed to realize the fully potential growth opportunities, which would otherwise have remained unsolved. " The validity of these words is confirmed by further many years of experience in increasing growth. The guys who work hard according to our methodology are growing up. Over the years, the system of special training has been enriched with new exercises, the effect has increased with the use of unconventional means and methods, the latest achievements of sports science. Currently (with timely treatment), most people who want to grow up can be helped. Moreover, and this is especially important, in a significant part of cases, an increase in growth is accompanied by an improvement in health status. And now we will get acquainted with our system in more detail

INTERESTING FACTS ABOUT GROWTH

Finding materials that have at least something to do with growth management, I noticed that so far there is a lot of obscurity. In general, the successes of the branch of anthropology that deals with growth management are not very great. There is especially little data that relate to human growth and development until the 20th century. On a small material it is difficult to derive patterns. Today it is known that a person inherits from his parents skin color, eye shape, nose shape, a lot of other signs, which include body length or simply growth. Therefore, tall parents usually have tall children, and vice versa. If generations of one family live for a long time in a limited space, say in a small village, then inevitably, sooner or later, men are forced to marry their more or less close relatives. And this process, fraught with incest, does not contribute to the renewal of the genetic fund of people. And in the good old days, over the centuries and millennia, many nations preferred not to leave their homes, lived apart and mixed little with strangers. It was in those days that such people recorded the smallest body length. Now children from parents from one village are less susceptible to acceleration. Active population migration in the modern world allows avoiding marriages between relatives, the colorful composition of residents of large cities, as well as possible, contributes to genetic diversity and, consequently, acceleration. German anthropologist F. Nold examined 4 thousand twenty-year-old boys. He found that the growth of sons is higher, the farther apart from each other are the places of birth of their parents. The average growth of those whose parents were born in one village or in one city block is 171.5 centimeters. Where places about

parents live about 10 km, boys were born whose average height is 172.1 cm. At a distance of 100 km, they are 173.6 cm tall and over 100-174.1 cm. In order to EXCLUDE 11 i ii. ■ 111 1111 v, the total agreed that, generally, the average growth is always set only for a specific group of people. Average growth can be for the population of a country, city or people living in it of a certain nationality, age, profession, etc. It would seem what difference does this make to a person, because you still can't part with your growth. But the difference, it turns out, is, say, psychological. For example, the inhabitants of northern France are half a head taller than the southerners, and the Native Normans, coming from Le Havre to Marseille, turn from "medium" to "high". And an ordinary resident of Montenegro (180-185 cm) becomes a giant among the South African Bushmen (135-140 cm). The Prussian king Friedrich Wilhelm I sent his emissaries throughout Germany, who searched for him and lured various promises to the royal army of young guys with a height of at least 180 cm. The king was incredibly proud of his guards, and other European monarchs also dreamed of such a representative guard, but unless you pick up a whole regiment of such thugs ... Ironically, it was in Germany, almost 250 years after the death of the harsh and cruel Frederick, in the city of Stuttgart that the "congress of the lanky" gathered. Of the 400 people who came there from all over Europe, there was not a single one below 190 cm, and the tallest - German Klein (translated "small") - was 223 cm tall. To date, the highest people on our planet are the Karimojong tribe (Uganda). Their average height is 2 meters. They also have the darkest skin, and pigment spots are even in their tongue.

The Karimojongs, nomadic herders, manage to breed cows in a semi-desert, more like a real desert. Since there is practically no other living creature in the places where they live, their main food is blood. The blood of totemic, that is, sacred, bulls mixed with cow's milk. Their millennial faith does not allow them to kill cattle. The man is growing. Acceleration (especially for children) became, like the weather in the old days, the on-duty phrase of the banter. Meanwhile, the topic is absolutely not new. The English anthropologist J. Ghent as early as 1869 revealed a general tendency to increase the growth of humanity as a whole. Anthropometric measurements of children were introduced in the most civilized countries only in the 30s of the last century. What our ancestors were 100 years ago we do not know. Individual skeletons cannot tell about it, firstly, because they are skeletons, and secondly, because they are separate: statistics are needed. I remember that in London, walking along the line of museum knights in armor of the most diverse designs, I marveled at their short stature. All the armor of these legendary Ivanhoe would fit the current 13-14 year old boys. About 10 years ago, another surprising discovery was made: in the Northern Hemisphere, everything happens the other way around. But neither latitude nor climate are decisive factors. In the Netherlands, for example, over 20 years, young men grew by an average of 4 cm, girls by 2 cm. The tallest children ended up in Iceland, although their parents are scared of being overweight. In 1882, the average growth of Moscow 15-year-old boys was 147 cm, in 1923 it was already 156 cm, and today it has exceeded 170! What is the matter here? Why? What does this mean and how long will it last? So far no one can answer this question. There is a lot if you can

to be interested in "equal" hypotheses, none of which, from my point of view, can withstand criticism: They began to eat better. But in the postwar years, the average nutritional level of residents of civilized countries has changed little. It cannot be said that Russia and Ukraip are too well fed, but even here the acceleration is not slower than in the "fat" countries. Influenced by radio waves, different receivers, antennas, televisions. But then, larger families should grow up in families with TVs, but this is not so. The radiation situation has changed. All this harmful nuclear technology is to blame, from computers and X-ray machines to A-bomb tests. But William Conrad Rengen, with whom all these misfortunes began, opened his "x-rays" a quarter of a century after Ghent spoke of acceleration. Another possibility is that the sun affects the development and growth of a person, since it affects absolutely everything that is done on Earth. This was spoken by the great Russian scientist Alexander Leonidovich Chizhevsky. "It can be considered precisely established," Professor B.A. Nikityuk in 1987, "that during the years of the active Sun, the sizes of newborns are smaller ..." But again, the acceleration curve (excluding the years of war) slowly but steadily creeps up, while the curves of solar activity are sinusoids. The most pronounced period of activity of the Sun is 10-11 years. The most plausible hypothesis seems to explain the acceleration of incest. Humanity began to live on its planet more fluidly. The number of interethnic marriages has risen sharply, but it has long been noticed that "half-breeds" are very often stronger, healthier, more talented than "purebreds". Studying the growth of draftees in a number of European countries, as early as 1924, Russian anthropologist V.V. drew attention to this. Bunak. This is a genetic decision so complex

tasks seem very attractive if the "purebred" were not accelerators. Acceleration is observed, albeit in a somewhat muffled form, and where mixed marriages are not encouraged. In short, there is no definite answer ... Among other acceleration hypotheses, one that deserves attention is one that tries to explain the phenomenon of accelerated growth of children by the influence of urbanization. No doubt, living in big cities is more comfortable, better food, better all types of services, including medical, higher psycho-emotional tone of the population, and hence stressful activity. All this can contribute to the growth and development of the child. But here's what's interesting: the accelerated growth of children in cities is becoming less noticeable compared to rural children. What is the matter? Does the village catch up with the city in terms of living? And this too, but the main reason, apparently in another. The advantages that urbanization initially brought were gradually turning into its disadvantages, which negatively affect the growth of the younger generation. These include: environmental pollution, physical inactivity, refined high-calorie and excess food, noise, crowding, stress, overwork, psychoemotional and information overload, as well as others that clearly prevent a person from growing normally. Speaking of accelerates, one cannot fail to mention the giants, some "peaks" among just tall people. It seems to me that they are more likely to cause pity than admiration, because excessive growth has never made them happy, as it were, they fell out of human society around them. Most often, the personality transformed into a spectacle. Many giants, seeking to slow down their growth, resorted to medical care - such specialists are, for example, in Germany. But if you manage to stop the growth of the body, then physicians are not able to slow down the growth of limbs.

The Pori agency, organized in Moscow not so long ago, talked about the Russian A. Sazonenko. His height is 240 cm. The data on the Russian woman Elizabeth Lysko has also been preserved. Donvmika was born in 1877 in the big and very poor ("we are in the city of Kraspokutsk. Until three years old she's nothing" and I began to aspire to her peers, and then began to strive for vnno ra <pi By ten years, her growth was already 102, and by seventeen - 227. Her enterprising uncle decided to make a show: "The Giant Girl. Together they traveled to all the major cities of Russia, Germany, Italy, England and other countries. Lisa received secondary education, spoke English, German. About her details nothing is known of her further fate. She died young in a foreign country. According to the Russian Book of Records, the tallest man in world history was a Russian citizen Fedor Makhov! His height was 2 meters 85 centimeters (weighing 182 kilograms). The correspondent of the magazine "7 days" reports that he personally saw the grave of our hero - on railway station Old Selo, near Vitebsk. Today, the giant is called in the newspapers either Makhov or Makhno. Born on June 6, 1878. He died on August 28, 1912. The tallest man in the world. Growth was 3 arshins 9 pips. " He died in the 35th year of his life. The growth indicated on the grave, which corresponds to 254 centimeters by modern standards, he was at a young age, but, according to numerous evidence, after that he grew significantly. Fedor Makhov was born in a peasant family on a farm near the village of Kostyuki. And today, local residents can indicate the place where he was born, nicknamed the Giant Farm. The talents of an amazing child showed up early. At age 8, the baby could raise an adult, his father taught him how to play the harmonica. At the age of 12 he took the bar

2 meters. He could sleep for more than 24 hours in a row. The shoemaker from the nearby village of Yazvino, Vasily Orlov, left evidence of the length of the giant's foot 51 centimeters. The palm was 31 cm. Fedor Makhov bent the horseshoes, one day he raised the roof of the hut. He developed power talents in the circus, where he twisted spirals from iron rods, and then straightened them, smashed a brick with a fist, lying raised a wooden platform on which the orchestra played. He was also engaged in wrestling. His brothers Stepan and Nikolai were a little taller than average. In the Vitebsk Regional Museum of Local Lore there are stored materials telling about how Fyodor Makhov got into the circus, and about his tours across Europe and the USA. He signed a contract with entrepreneur Robert Cook (and according to another version, the local landowner Bronislav Korzhenevsky made an offer to conquer Europe) and set off around the world. The journal "Nature and People" in 1903 published such an article about him, "The Tallest Man in the World." They are now unanimously recognized by the Russian giant Theodor Makhov. Currently, he arrived with his impresario in Berlin, where he appears in a panopticon. In the Berlin Anthropological Museum, Makhov was carefully measured and weighed, and he was given a document of the following content: "Theodor Makhov, born in Russia, in the town of Kostyuki, Vitebsk province, has a height of 285 cm and is among the highest giants that have ever been existed on the globe. In many ways, it is of great interest to science. And indeed, all the giants shown so far in Europe were in most cases 12-15 cm lower than Mach. Theodore Makhov comes from an ancient family, whose ancestors moved to Russia from the south, from Syria. Makhov's parents, as well as his two sisters, are distinguished by quite normal growth; his grandfather was very tall, but, in any case, not a giant. Theodore Mahov now time is only 22 years old. To give at least some idea of the size of his body, let's say that his boot, barely reaching the giant's knee, reaches the chest of a normal

person, and a 12-year-old boy could fit his head in it. Impresario pays Makhov 5000 rubles. annually and besides it contains at its own expense. Only with such a huge amount of money was the impresario able to persuade the giant to appear in panopticons, since Makhov, an intelligent and not needing man, for a long time refused such an honor. ” When the giant came on tour in St. Petersburg, metropolitan reporters found out how he eats. In the morning he drank about two bottles of milk, while eating a dozen and a half hard-boiled eggs and 6-8 pieces of bread. At noon he was served a kilogram of fried meat, more than a kilogram of potatoes, a kilo of bread and a bottle of beer. At lunch cost a few plates of meat soup and two bottles of beer. For dinner, Fedya ate from 10 to 15 eggs and several slices of bread. However, the entrepreneur, profiting from it, fed him poorly, he was annoyed by the hardships of a nomadic life. The peasant son did not like all this, and he returned to his home station, Old Selo. He built a farm with the money he earned. The people called the new place of residence the Giant Farm. Fedor’s house has not survived to our times - it was destroyed during the war, but the villagers still call this place the Great. Here he and his wife, teacher Efrosinya Lebedeva, who was 70 centimeters lower than him, gave birth to five children. All the children were tall, but none of them was above 2 meters. Having caught a cold while clearing the bed of the local Zaronovka River, Fedor Makhov suffered from foot disease. Died is believed to be from lung disease. But it was rumored that he was poisoned by rivals on the wrestling mat. An obituary appeared in the magazine Russian Sport, announcing this unfortunate event. One of the sons of Makhov, Radimir, or, as he was also called, Rodion, studied at the Minsk Medical Institute. Once at a lecture I heard a mention of his phenomenal father. He called himself. Scientists became interested and transmitted the proposal through Radimir

widow sell unique skeleton. For it, 5 thousand rubles were offered, and in those years it was a substantial sum (a loaf of bread, for example, then cost 14-20 cents). 27 years after the burial, the bones from under the monument of the largest man in the world were removed, put in a box and taken away by scientists. The coffin and the monument were returned to their original place. The grandson of the giant Evgeny Nikolaevich still keeps the memory of his ancestor - postcards, photographs, newspaper clippings It is from the words of the grandson that there is a version that Fedor, having moved to the farm, did not leave his performance in the circus. He often traveled to Germany with his family. In recent years, the public has again shown interest in the life of our extraordinary countryman. The fact is that the American Robert Wadlow, who lived at the beginning of the last century and reached 272 centimeters, is officially recognized as the tallest man in the world. Our tallest contemporaries - Pakistani and American - are 233 and 231 centimeters tall, respectively. The growth of Fyodor Makhov, equal to 285 centimeters, was indicated by the journal "Scientific Data and Life" for 1970, the French biologist J. Rostan in his book "Life" and even science fiction writer Alexander Belyaev in the novel "The Island of Dead Ship". The Guinness Book of Records calls the tallest man in the world an American Robert Pershing Wadlow - 2 m 72 cm. He was born on February 22, 1918 in the city of Olton (USA). A middle name was given to him in honor of General Per

Shinga, who at that time took part in the First World War. Robert grew up very fast, and at five he wore clothes that a 17-year-old boy could wear. Her family members (he had two brothers and two sears) had normal growth. He wanted to live normal- and> II ii iii.ю. was fond of photography, was a good student. joined the Boy Scout organization. Robert "■ to pi. Loved his mother Addy, for which he received the nickname" I The Great Giant. "In 1933, Robert half-finished the largest postcard that Alton's post office ever delivered. It was 14 by 22 inches (about 35 by 59 cm). At the age of 18, he had to sew clothes that were three times the size of the largest of the standard ones. At twenty, he took part in an advertising tour for the International Shoe Company. His father had to change his family car and remove the front passenger seat, so that Robert can sit back, extended their long legs. Father and son traveled 300,000 miles a day. For this, the company provided him with free shoes. When in July 1940, Robert was in Michigan, on his feet (he had special metal rings on his ankle, without which he couldn't move about) blisters developed from rubbing and an incomprehensible infection got into his body. After medical help and blood transfusion the development of the infection stopped, but on July 15th he died in his sleep. Robert's body will be returned to his hometown. Out of respect for him, all the companies of the fool closed at the time of the funeral, in which twenty-seven thousand people participated. The coffin was so heavy that smoke was carried by twelve people. Parents Wad- "buried their son's body under a concrete slab because of fears that his body would be exhumed for medicine for their research.

"Gentle giant" has a special place in the history of Olton. He is remembered as a quiet young man who served as a source of inspiration for all those who knew him. In 1980, the Olton Museum of History and Art opened an exhibition dedicated to Robert Wadlow. In 1984, townspeople decided to perpetuate the memory of Robert, and in 1985 a bronze statue was erected on the campus of the University of Illinois Southern School. In 2000, the Air Force made a documentary about the giant, which was shown on the Bizsovegu channel. Dan Brannan, editor of the Thie Telégggar newspaper of Olton, wrote a biography of Wadlow called The Giant Boy. In St. Petersburg in 1913, the giant Mongol Pureviin Gongor (245 cm), who arrived as part of the government delegation from Mongolia, was surrounded by great attention. Nowadays, the peasants from the Gansu province Tan Tochen (233 cm) are considered the highest people. For a long time Gabriel Montone from Mozambique went to the "champions" in growth. There were few buildings in the city of Pasu de Arcos, a suburb of Lisbon, where he could stand at full height (245.7 cm). He sat or lay at home, went for walks early in the morning, because in the afternoon he was immediately surrounded by a hated crowd of onlookers. Alam Chann from Pakistan (247 cm) took the palm from him, obviously, today the tallest man on the planet. Although my 2012 information could already be out of date.

SHORT PEOPLE CAN SLEEP QUIETLY - THEY ARE JUSTIFIED ...

A few words about the short people. For many of us, the Belgian newspaper Suar writes, the appearance of famous people is usually associated with high stature, good posture, and broad shoulders. But very

often such representations are erroneous. Among the monarchs, for example, not everyone looked like the Russian Tsar Peter I. The very power-hungry English Queen Elizabeth I was not very tall. . n i. Ily character than on the "iron" queen. N Napoleon, Stalin and Franco had something in common besides the fact that they were all tyrants and dictators. All these people were stunted, and this helped to root the myth that men below average were supposedly more aggressive than men tall. Moreover, it was found that 80% of people believe in this. However, now the reality of the so-called "Napoleon complex" or "low man syndrome" has undergone scientific verification. Researchers have found that, on average, tall people are more prone to aggression in conflict situations. This study is likely to be welcomed by short men who complain that they face discrimination and experience more difficulties than their tall brothers. By the way, the study showed that, apparently, the influence of this myth is bearing fruit. Short men usually earn less and women seem less attractive. Probably, the thrice-married Tom Cruise, who has a small growth, however, according to scientists, with a decrease in growth by one inch, women who consider you attractive, is 5% less likely to agree. Low Men: Napoleon Bonaparte. Historians differ in estimates of his growth, from 158 cm to 167.5 cm. Long before 1.1 k he became emperor, he was called Little Kapr.il. Inexpressive figure often disturbed him in

the conquest of women's hearts. But after he became a monarch, growth no longer impeded amorous successes. Joseph Stalin. According to police documents from 1902, the growth of the Soviet dictator was “2 arshins 4 12 h”, that is 162 cm. Joseph Goebbels. The Minister of Education and Propaganda of Nazi Germany was nicknamed the "evil dwarf" - his height was 165 cm. If you go from monarchs to mere mortals, or rather to writers, then you should talk more about George Sand. Dozens of novels are devoted to this French writer, numerous films have been shot in which they tell about her love hobbies, about how easily she captivated men. Meanwhile, chubby, with an expressionless face and a height of 1 meter 54 centimeters, she could hardly be credited to the crazy beauties. You can add composers to this list. If you find yourself in Bonn, call in Beethoven's house-museum and go up to the second floor; then go to the room in which he was born. There is a pedestal with a bust of the composer. The total height of the pedestal and bust exactly corresponds to its growth - 1 meter 60 centimeters. Turning to the modern era, it is worth talking about the growth of some world famous singers and actors. The great Edith Piaf, he was 1 meter 47 centimeters. She seemed frail and puny, but when she started to sing, she became graceful. It seems that for many it will be a surprise that the growth of Elizabeth Taylor is only 1 meter 57 centimeters. But this was forgotten before her captivating look and no less attractive bust. However, the actress in her wardrobe has never forgotten about stilettos. One of her costumes in her memoirs wrote in detail about how much effort was spent

during the filming of "Cleopatra" to give Liz the magnificent posture of the legendary queen. However, the "Suar" continues further, Hollywood stars such as Judy Garland and Marie Pickford were also short. The growth of the latter, for example, was 1 meter 55 centimeters. It still remains a mystery why the American actor Dustin Hoffman, whose height is 1 meter 60 centimeters, was so attracted to. It cannot be called beautiful, the newspaper writes, it is angular, its appearance at first glance attracts little. On the screen, he usually appears slightly stooped and looks like a kind of fifty-year-old teenager with a hidden smile on his face. But Hoffman understood the main thing: to be liked, it is not necessary to look like an irresistible seducer. If you distract from celebrities and talk about the growth of ordinary people, the Soir concludes, then among Europeans it is the lowest among the Portuguese - an average of 1 meter 67 centimeters. The smallest among the entire population of the planet are representatives of the Mbuti tribe living in Zaire. Their average height is 136 centimeters. They stop growing during adolescence due to a lack of growth hormones. The first idea that a man is below average is suffering from an inferiority complex that is trying to compensate for his actions, put forward by the Austrian psychologist Alfred Adler. As an example, he cited the same Napoleon, who, according to the scientist, went to extremes because of the strong psychological need to compensate for what he considered to be inferior - his short stature - although he was slightly higher than the average person time. However, in a study for a program called "Fuck off, I'm small," the University of Central Lancashire invited 10 men less than 1 50 cm tall and 10 men of average height to undergo a test

physical abilities, reaction speed, and coordination of vision and hand work. In fact, men took part in an experiment to identify aggression, the so-called "Game with Chopsticks" - the first way in the world to check whether there is a "Napoleon complex". Participants of different growths were divided into pairs, and were tasked with fencing across the table on sticks. In this case, one of the participants was ordered in advance to specially provoke the other by hitting him on the fingers. Contrary to expectations that are associated with the "Napoleon complex", participants' cardiomonitors showed that tall men reacted more aggressively. Dr. Mike Esley, the lead psychologist, said, "The results support the view that "little man's syndrome" is a myth. When people see that a short person is aggressive, they usually blame it on his height, simply because it is striking." A television documentary from the Body Image series was shown on television. In it, the stuntman and actor Paul Aow, whose height is 4 feet 8 inches (142 cm), told how difficult the life of short people is. So, for example, the program talked about the annoying problem that Love constantly encounters in public toilets, he cannot reach the urinal. There is something to get angry about. The influence of male growth on his character has been studied more than once by various scientists. Last year, researchers from the University of Wroclaw in Poland found that low men are more suitable for creating a family than high. Scientists have found that women prefer tall men to flirt, but they are more likely to choose a lower partner to create a serious relationship. Other studies also conducted last year showed that tall men are much more

more successful in professional activities and romantic relationships. The results of the experiments published in the journal *Esopotisz apsi Nitap Vioio* ^ y showed that the average manager is three centimeters higher than the production worker. So, the concepts of “high”, “medium”, “undersized” *otshkh'igp'lyiy* and depend on the environment. But there is still one indicator that claims to be the absolute benchmark. This is the arithmetic mean of all people on Earth or, in other words, the average height of a person on our planet. For men, it is 165 centimeters, for women - 154 centimeters. Normal growth differs from average in that its standards are set on healthy people whose growth is not impaired. Naturally, normal growth, like average growth, depends on the contingent and is subject to fluctuations. In general, the growth of an adult from 155 to 190 centimeters is considered quite normal. It is worth recalling that a normal child in his first year of life grows by 25 centimeters. Then growth increases less intensively. Only at the beginning of puberty (in girls at 10-12 years old, in boys at 12-14 years old) growth rates again increase. One of the main regulators of growth and development is hormones produced by the endocrine glands, the pituitary gland. By the end of puberty, the hormones of the gonads inhibit the activity of the pituitary gland. This mutual influence determines the growth rate, final body size, and puberty. Now almost universally, puberty ends in adolescents two years earlier than in the last century. At the same time, ossification of “growth zones” takes place, growth stops for girls at 16-17 years old, for boys at 18-20 years old (although there are exceptions). Now the average growth of urban youth on planet Earth is 169 cm. It is believed that by the end of the century it will reach 173 cm.

GROWTH FORECAST

Is it possible to predict a person's growth? Today it is clearly defined - growth can be accurately predicted at the age of 8-11 years. At an earlier age, the prognosis is less accurate. Growth prediction is also difficult during puberty (for girls aged 11-14 years, and for boys 13-15 years old). It is almost impossible to predict the final growth by annual increments in body length. It is also interesting that the faster formation of the foot and hand, in comparison with other morphological parameters of a person, can also serve to predict growth. That is, if a child in the primary grades of the school has average height for his age, but already wears a large shoe size, and besides, he has long hands, we can assume that in the future he will overtake many of his one-year-olds in height. Morphologists note that the length of the foot and hand can serve as a more reliable basis for prediction than even the growth itself. Based on the experimental material, Slovak researcher V. Karkus determined the formulas for the dependence of the final growth indicators of boys and girls on the growth of their parents. years

father growth + mother growth x 1.08 For boys: - ----- - ----- -----: -. 2 „
father's height x 0.923 + mother's height For girls: - ----- -----.

And the Slovak researchers Shramkova, Prokogtets and Zelezni proposed tables of probable prognosis of a person's body length in adulthood depending on growth in different age periods (Tables 1, 2). The tables are given in an abridged version. Using them is quite simple. The initial data are the age and height of the boy or girl. In the tables at the intersection of vertical and horizontal numbers indicated growth in adulthood. For example, with a boy growing 127 cm at the age of 9, he may have, when he becomes an adult, a body length of 171.0 cm, and if the same height is 11 years old, he will grow to 163.5 cm.

Table 1 Male body length in depending on his height in childhood

11 <measured growth (cm)

Age (years)

<i>11 < измеряемый рост (см)</i>	<i>Возраст (лет)</i>			
	<i>8</i>	<i>9</i>	<i>10</i>	<i>11</i>
ПО	160,7			
111	161,6	157,0		
112	162,4	157,9		
113	163,3	158,8	154,8	
114	164,2	159,6	155,6	
115	165,1	160,5	156,5	
1 И»	166,0	161,4	157,4	
117	166,9	162,3	158,2	
118	167,8	163,1	159,1	
1 19	168,6	164,0	159,9	
120	169,5	164,9	160,8	
121	170,4	165,8	161,6	158,8
122	171,3	165,6	162,5	159,5
123	172,2	166,5	163,3	160,3
124	173,1	168,4	164,2	161,1
125	173,9	169,3	165,0	161,9
126	174,8	170,1	165,9	162,7
127	175,7	171,0	166,7	163,5
128	176,6	171,9	167,6	164,3
129	177,5	172,8	168,5	165,1
130	178,4	173,6	169,3	165,9
131	179,3	174,5	170,2	166,7
132	180,1	175,4	171,0	167,5
133	181,0	176,3	171,9	168,3
134	181,9	177,1	172,7	169,1
135	182,8	178,0	173,6	169,9
136	183,7	178,9	174,4	170,7
137	184,6	179,8	175,3	171,5
138	185,5	180,6	176,1	172,3

<i>Измеряемый рост (см)</i>	<i>Возраст (лет)</i>			
	<i>8</i>	<i>9</i>	<i>10</i>	<i>11</i>
139	186,3	181,5	177,0	173,1
140	187,2	182,4	177,8	173,9
141	188,1	183,3	178,7	174,7
142	189,0	184,1	179,6	175,5
143	189,9	185,0	180,4	176,3
144	190,8	185,9	181,3	177,1
145	191,6	186,8	182,1	177,9
146	192,5	187,6	183,0	178,7
147	193,4	188,5	183,0	179,5
148	194,3	189,4	184,7	180,3
149	195,2	190,3	185,5	181,1
150	196,1	191,1	186,4	181,9
151		192,0	187,2	182,7
152		192,9	188,1	183,5
153		193,8	188,9	184,3
154		194,6	189,8	185,1
155		195,5	190,7	185,9
156			191,5	186,7
157			192,4	187,5
158			193,2	188,3
159			194,1	188,3
160			194,9	189,9

And can tall parents have a completely healthy stunted child? Can! And besides, in full accordance with the laws of heredity, if interpreted in an un simplified manner.

According to these laws, heredity may not appear immediately from the parents, but after one or several generations. Therefore, it is not surprising if a child grows “neither to mother nor to father”, there were also grandmothers and great-great-grandfathers ...

However, it often happens that all relatives up to the twelfth knee were normal or above average height, and their a descendant of growth did not come out. What is the matter?

But the thing is this. Heredity is very important for growth, but not fatal. It is more correct to consider it as a kind of indicative program, according to which

rock one individual inherits the prospect of growing no lower than 165 centimeters and no higher than 185 centimeters, another - from 160 to 190 centimeters, a third - from 140 to 175 centimeters, etc. What they actually grow up to a large extent hangs on environmental conditions AND SO <GONIPG / Idoroi; a favorable combination of <GOYATSLI GV promotes the implementation of the hereditary program to the maximum, unfavorable - inhibits the implementation of this program, and growth stops at the lower bounds. And one more thing: genetics say that with hereditary stunting in healthy people, treatment in any way is not effective, and treatment with endocrinologists is even harmful, because the normatively established regulation of the exchange of non-guests will inevitably be impaired and the consequences of endocrinological treatment may turn out to be unpredictable.

Table 2: Woman's body length depending on her height in childhood

// long hair (cm)

Age (years)

// шеряемый рост (см)	Возраст (лет)			
	8	9	10	11
111	145,6	140,6		
112	146,8	141,7		
113	147,9	142,8	143,4	
114	149,1	143,9	144,2	
115	150,3	145,0	145,1	
116	151,4	146,1	145,9	
117	152,6	147,2	146,8	
118	153,8	148,3	147,6	
119	154,9	149,4	148,5	
120	156,1	150,4	149,3	148,7
121	157,3	151,5	150,2	149,4
122	159,6	153,7	151,8	150,7
123	159,6	153,7	151,8	150,7
124	160,8	154,8	152,7	151,4
125	161,9	155,9	153,5	152,1
126	163,1	157,0	154,4	152,8
127	164,3	158,1	155,2	153,4

Measured Height (cm)**Age (years)**

<i>Измеряемый рост (см)</i>	<i>Возраст (лет)</i>			
	<i>8</i>	<i>9</i>	<i>10</i>	<i>11</i>
128	165,4	159,2	156,1	154,1
129	166,6	160,3	156,9	154,8
130	167,8	161,4	157,8	155,4
131	168,9	162,5	158,6	156,1
132	170,1	163,6	159,5	156,8
133	171,3	164,7	160,3	157,5
134	172,4	165,8	161,2	158,1
135	173,6	166,9	162,0	158,8
136	174,8	167,9	162,9	159,5
137	176,0	169,0	163,7	160,1
138	177,1	170,1	164,6	160,8
139	178,3	171,2	165,4	161,5
140	179,5	172,3	166,3	162,1
141	180,6	173,4	167,1	162,8
142	181,8	174,5	168,0	163,5
143	183,0	175,6	168,8	164,1
144	184,1	176,7	169,7	164,8
145	185,3	177,8	170,5	165,5
146	186,5	178,9	171,4	166,2
147	187,6	180,0	172,2	166,8
148	188,8	181,1	173,0	167,5
149	190,0	182,2	173,9	168,2
150	191,1	183,3	174,7	168,8
151		184,4	175,6	169,6
152		185,5	176,4	170,2
153		186,5	177,3	170,9
154		187,6	178,1	171,5
155		188,7	179,0	172,2
156			184,1	176,5
157			180,7	173,5
158			181,5	174,2
159			182,4	174,9
160			183,2	175,5
161			184,1	176,2
162 ‘			184,9	176,9
163			185,5	177,5
164			186,6	178,2
165			187,5	178,9

The race of the Velikans

Perhaps there is no such people on Earth in whose tales and traditions giants would not be found. Mention of the giants of the human race is present not only in oral folklore, but also in written sources claiming historical authenticity. For example, the Bible cites a “report” by a scout sent by Moses to Palestine: “... We saw giants there too ... from a gigantic family; and we were ... before them, like locusts ... ” Or the Qur'an says about the giants that they were "higher than the highest palms." And the story of Goliath, struck by David, is also from this category.

In the Russian chronicles there are records of how in the battle on the Kulikovo field the nomads put up a giant four meters tall, but the size did not save him from the arrows of Russian soldiers. The Arab diplomat Ahmed ibn Fadlan, who visited the banks of the Volga in 922, also mentioned in his notes that he had a meeting with a very tall man: “And I saw that his head was like a big tub. His ribs are similar to the largest dry fruit branches of palm trees, and in the same way the bones of his lower legs and both of his ulnar bones. And here I am near this man, and I see growth in him, measuring with my elbow, twelve cubits ... ” In later times, people stopped meeting giants, but began to find their remains. One of the old books entitled “History and Antiquity”, which is now stored in the library of the University of Oxford, contains a report on the discovery of a giant skeleton made in the Middle Ages in Cumberland. “The giant is buried in the ground to a depth of four yards and is in full military clothing. His sword and battle ax rest beside him. The skeleton is four and a half yards (4 meters) long. ” With the development of archeology, finds, and even burials of people of abnormally high growth, were found in various parts of our planet.

In 1877, near Evreki in Nevada, prospectors worked on washing gold in a deserted hilly area.

One of the workers accidentally noticed something sticking out over a cliff ledge. People climbed onto a rock and were surprised to see the human bones of the foot and lower leg along with the patella. The bone was immured into the rock, and the miners with pickaxes freed it from the rock. The stone, into which the rest of the leg was walled, was quartzite, and the bones themselves turned black, which indicated their solid age. Several doctors examined the bones and concluded that they undoubtedly belong to humans. But the most intriguing aspect of the find was the size of the leg - 97 centimeters from knee to foot. The owner of this limb should have had a height of 3 meters 60 centimeters during life. Even more mysterious was the age of quartzite, in which they found a fossil - 185 million years. Subsequently, scientists repeatedly examined the place of the find in the hope of finding the remaining parts of the skeleton, but, unfortunately, did not find anything else. Six years later, the German paleontologist and anthropologist Larson Kohl found the skeletons of giant people on the shores of Lake Elysey in Central Africa. Twelve men buried in a mass grave had a height of 350 to 375 centimeters during their lifetime. It is curious that their skulls had sloping chins and two rows of upper and lower teeth. Such an anomaly could still occur in one individual, but so that in twelve at once ... During World War II, a fossilized skull 55 centimeters high was found in Poland, that is, almost three times more than that of a modern person. And in this case, the estimated growth of the giant was three and a half meters. Unusual skulls and bones, significantly exceeding the size of the remains of ordinary people, were found in Alaska. In 1950, during the construction of the road, workers unearthed a grave hill in which they found two

huge fossilized skulls, vertebrae and leg bones. The vertebrae were three times larger than that

of a modern person, the length of the shin bones was also striking in size - from 150 to 180 centimeters, and the height of the skulls reached 58 cm. As in the case of the Central African find, the ancient giants of Alaska had a double row of teeth and disproportionately flat heads. Each skull had a neat round opening in the upper part. It should be noted that the custom to deform the skulls of infants in order to force their heads to become elongated as they grow, existed among some Indian tribes of North America, but the double row of teeth did not find any explanation. According to documents, the skeleton of the largest giant, found at the moment, has a height of more than five meters, and it was dug in 1956 in Cagayan, in the Philippines. Each of its front teeth reaches a width of 5 centimeters and 15 centimeters in length. According to scientists, in life this person could have a height of 5.40 meters. Similar finds have recently been made also in South Africa, Syria, Morocco, Georgia, the United States and Russia. In addition to the bony remains, evidence of the existence of the ancient giants are the 60-centimeter prints of bare feet left by them on petrified clay. The stride length of giants is usually measured 130 ■ optometers. Calculations show that their growth in this case could reach three and a half meters, and the weight of 10 kilograms. Moreover, the age of the rocks in which the giant feet bounced off, as a rule, pulls on

... a hundred million years, that is, it turns out that they are in the era of dinosaurs. In many cases, the remains of giants are found in 11 parts of the river's noses, and in others - in specially made stumps. This is indicated by the posture of the deceased, and with

stone tools accompanying him are of equally enormous size. They are sometimes found

separately from skeletons. So, six kilometers from Safita (Syria), archaeologists extracted axes weighing 3.8 kg from the excavation. In Morocco, stone artifacts of enormous size are found, and especially often amaze with their diversity. Among them stand out tips, batons; plows, chisels, knives, weighing 5 to 9 kg. Even less often, archaeologists come across the metal products of giants. A copper ax weighing about 30 kilograms was found in an ancient burial ground in Ohio (USA). Another such ax is found in the US state of Wisconsin. Its weight and size leave no doubt - only a very tall man, besides possessing gigantic strength, could work such a tool. All these amazing findings have still not received a rational explanation. Many theories have been put forward, but a single one that would combine all the facts into a coherent system, while no one has proposed. According to the biblical version, the giant skeletons found in the earth's layers belong to the Nefelim - fallen angels. The Nefelim, according to the authors of the scripture, were born from angels and "daughters of men" and appeared contrary to divine will, and therefore were not included in the kingdom of God and did not have the right to resurrection. But they could not intermarry with people. The explanation of the scientists of the academic camp that the remains of giants belong to large primates does not hold water. Yes, indeed, in the not so distant past, a monkey lived on the territory of China, which paleontologists called giant petioes for their grandiose sizes. But in this case, nothing but size, giant giants and giants are not related. You do not need to be a specialist in comparative anatomy to see the differences between the skeleton

man and monkey, and the found skeletons of giants retain all the proportions of homo sapiens.

And the forelimbs, unlike the monkeys, they are not elongated, and the skull is not beveled. In addition, as already mentioned and will be said in more detail, many of the giants' findings relate to deposits formed hundreds of millions of years ago when the monkeys did not yet form as a species. For the same reason, the existence of giants of a rare disease that causes abnormally high growth cannot be explained. Everyone knows such phenomena as Fedor Makhov, Robert Wadlow and others. There are such people now, and certainly they were born in different historical eras. Such an explanation would still be valid for skeletons found in sediments of the last several thousand years, but not for finds of the prehistoric period. So, maybe the mysterious giants were not people? The Sumerian chronicles brought to us information about the Anunaki - creatures that in all respects resemble people, but reach more than three-meter growth. If we shift the ancient narratives to a language that we understand, then we get quite interesting things: the Anunaki were inhabitants of the planet, revolving around the Sun in a very elongated orbit. This planet is not discovered by astronomers, but is calculated by disturbances in the orbits of other planets. This hypothetical body was given the name Nibiru. From the Sumerian traditions it can be understood that every 3600 years Nibiru approaches the Earth and the Anunaki have the opportunity to visit our world. Their goal is quite pragmatic - gold. True, not for the sake of forgiveness, but solely for the sake of saving his world. "Since the orbit of Nibiru is extremely elongated, at this planet's greatest distance this planet practically receives sunlight and its inhabitants suffer from state of emergency But the Anunaki came up with a way to concentrate • • * m. I. light and created a special shield for this,

plated with gold. For only three and a half thousand years, the gold layer has faded and needs

to be renewed, but there are no deposits of gold on Nibiru. So the brothers in reason use the Earth as a raw material base. By the way, according to scientists' calculations, the next time Nibiru will approach our planet in 2012, so there is a chance to check whether there are any references in the press to sudden encounters of earthlings with giants. According to the same legend, man is the product of genetic engineering between Anunaki and terrestrial monkeys. They created us, supposedly to work in mines, and at the end of the work, humane aliens did not destroy the product of the experiment as unnecessary, but left to their own devices. But humanity, as they say, turned out to be not bastardly sewn and not only survived, but also created its own civilization. Another hypothesis is based on the fact that petrified bones and traces of giants are found mainly in deposits of a very ancient age. So, not far from the city of Carson City (Nevada, USA) a whole path of clear traces of bare human feet was found in the sandstone. The length of the foot, forever imprinted in the breed, is almost 60 centimeters! The find is about 248 million years old (end of the Paleozoic era)! The giant imprint of a human leg found in Turkmenistan is a little younger - it is only 150 million years old (Jurassic period). The fossilized footprints dating back to the Cretaceous period in Glen Rose (Texas) reach sizes of 55 by 14 centimeters, and, no less surprisingly, are located next to the tracks of the Brontosaurus. But in these epochs not only humans, but even sufficiently developed mammals on Earth were not found. The version about the existence of some ancient civilization “where each individual achieved growth under four meters, also does not look convincing. Too few finds. Much more true

similar seems the assumption of an alien landing party that landed on Earth in time

immemorial. However, not necessarily the giants, whose remains were found in sediments of the Jurassic period, were contemporaries of dinosaurs and flew to Earth from another planet. It is possible that they got there from the future and are thus our distant descendants. Given the different age of the finds, one has to admit that there were several such landings, and in each case, the visitors did not depart back, but remained on Earth, where they died over time. It can also be reliably argued that in many cases giants arrived on Earth in groups, as indicated by the nature of the burials. They buried their dead in the same way that we do. But still - why didn't they come back? Why, judging by the surviving remains, did they lead a lifestyle completely uncharacteristic of a high-tech civilization that mastered interplanetary flights and time travel, but used stone (less often copper) axes? There can only be two explanations: first, they remained on prehistoric Earth due to the disaster; second, they were exiled. As you can see, at the moment the mysterious giants have posed more questions to inquisitive minds than they have allowed to get answers. It is hoped that this will not always be sooner or later, we will find out what the race of giants was.

ABOUT GROWTH FROM THE POSITION OF MODERN SCIENCE

The mouse eventually becomes the size of a mouse, a kitten - a cat, a calf - a cow ... One. \<> iom, an apple from an apple tree ... The growth of young and children is a common phenomenon, which seems to be happening as if by itself. - How else? - the reader may be surprised - i - eh. Kohl was born, and is growing in its own way.

But it happens, it turns out, and otherwise. Suddenly, a phenomenon arises that amazes and discourages others. And then it becomes necessary to understand the hidden causes of the “miracle”, or even interfere in the work of nature’s workshop. There are, for example, dwarfs, which from birth to old age remain no higher than 40-50 centimeters. Some of them in their entire lives do not grow even a centimeter! And it also happens that a child under 3-4 years old develops, like all his peers, and then growth stops. Someone growth stops at 8-10-12 years. And there are children growing literally by the day and by the hour: at 7–9 years old classmates are waist-high, at 15–17 they can look almost out of the window of the second floor. To understand why these children grow differently, we’ll take a closer look at how the “growth workshops” of living organisms, including humans, work. To begin with, rapid and barely noticeable growth, giants and midgets, giants and dwarfs are by no means a privilege of people, but universal phenomena of the animal and plant world. Heads of the same sort of cabbage can be grown over the summer and are 10 centimeters and 2 meters high. Tomato bushes can stretch for 15 centimeters and 15 meters at the same time. The same is true for animals. If desired, a horse the size of a dog can be raised from an ordinary foal, and a chicken from an eagle can be raised from an incubator chicken. You can grow a mouse with a cat or a cat with a mouse. In short, experts have learned to control the growth rate and body size over a wide range. However, before coming to this, they had to find out a number of questions regarding growth and its regulation. We will try to figure it out. So what underlies different growth with the same heredity? Why do some grow fast, others slowly, others do not grow at all? As with similar genetic prerequisites for growth, some may

become giants and others dwarfs? In order to answer these questions, it is necessary first of all

to find out under what prerequisite growth occurs or, what is the same thing, without which growth is fundamentally impossible? Imagine a very real situation when a living organism (for example, a puppy) is kept in good conditions, receives full-fledged feeding and nonetheless does not grow. It does not grow because in his body there is exactly what without which growth is impossible. This "exactly that" is hormones. Hormones are called special chemicals that are produced in the endocrine glands and enter the bloodstream. Currently, over 60 hormones have been discovered, each of which affects certain cells, tissues, organs, determine a certain effect. One hormone, for example, causes tanning of the skin, the other - the formation of milk, the third - vasospasm, etc. If for some reason the hormone is not produced, there is no corresponding effect. The above fully applies to the length of the body. An organism grows only if the corresponding hormones associated with the growth function act on its cells, tissues, organs. They are produced in at least four glands: the pituitary, pancreas, genital and thyroid. That growth is controlled not by one hormone, but by several, one should not be surprised, because growth is one of the most important integrative functions of the body. Violation of the production of at least one of these hormones or a change in their ratio in the body leads to growth pathology. If there are too many hormones, uncontrolled growth occurs, if hormone production stops, growth stops. What is growing under the influence of hormones? Everything: muscles and tendons, vessels and nerves, intestines and hair. But in order for a person to become taller, this is not enough. The increase in the longitudinal size of the body almost exclusively depends on the elongation of the skeleton, or rather,

on how, under the influence of hormones, bone growth occurs in length. This is where the key to understanding many of our issues is. So how do bones grow? The precursor to bone is cartilage. Cartilage cells multiply and partially turn into bone cells, forming bone tissue. Thus, initially the bone is an accumulation of cartilage tissue with a small number of bone cells - the core of ossification in the middle (diaphysis) and the growth of cartilage cells at the ends (epiphyses). As they multiply in the epiphyses of the cartilage cells, some of them turn into bone cells (skeletal maturation), ensuring linear bone growth from the center to the periphery

(Fig. 1). Epiphysial fissure (growth zone) \ Bone \ \ D-ткань tissue \



D Bone tissue ■ The core of the ossification _ Epiphysis,,Diaphsh, Epiphysis

With the normal development of the body, in the pineal glands in a particular year of life, their ossification nuclei appear. They gradually increase and approach the bone core of the diaphysis. At the same time, the cartilaginous tissue located between the diaphyse and epiphyses, from which bone growth occurs, decreases all the time, turning into a narrow epiphyseal gap. Finally, the epiphyses fuse with the diaphysis, the cartilaginous epiphyseal gap disappears, and bone growth in length stops.

The appearance of ossification nuclei in the pineal glands, the stages of their growth and intergrowth with the diaphysis and each bone occur at certain times, starting from birth and ending by 18-20 years. At this age, the epiphyseal gaps disappear and, therefore, the body's

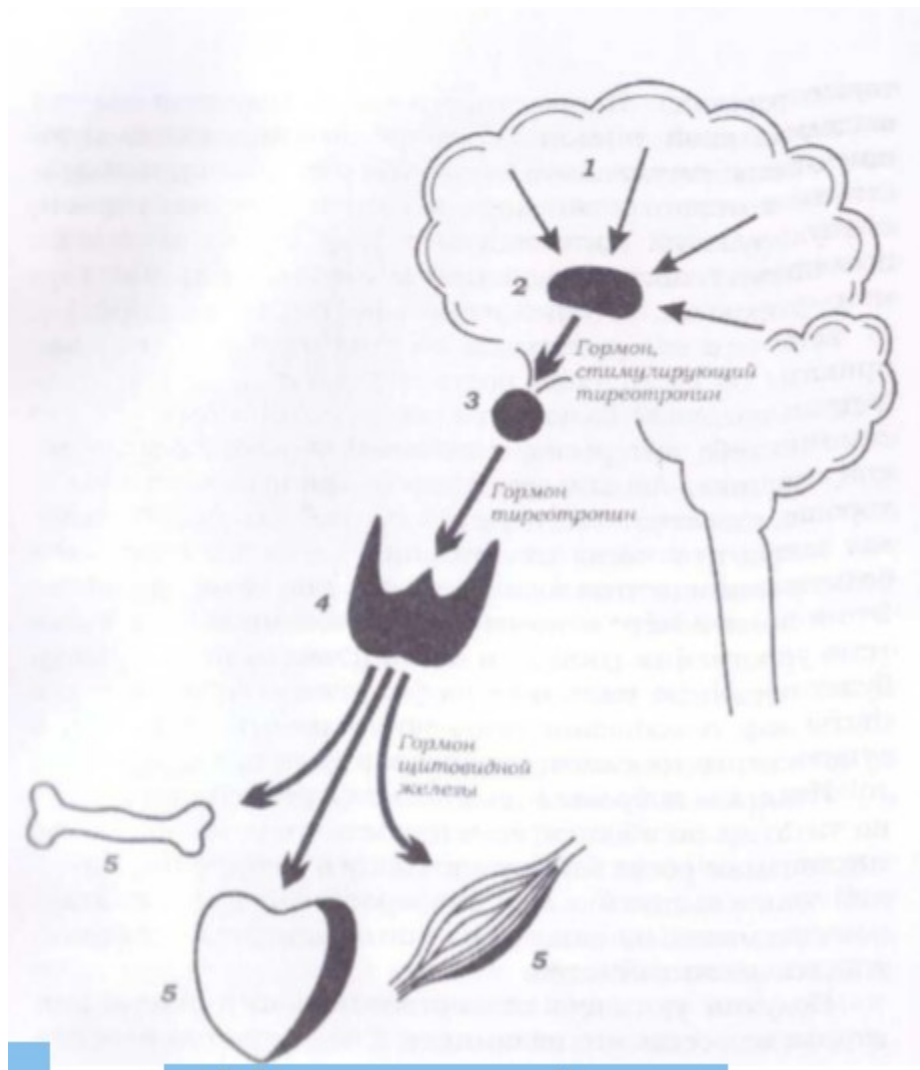
growth in length stops completely. The pattern of ossification of the skeleton allows, by the way, to accurately determine the "bone age" and its correspondence to the child's age. This is important not only for the diagnosis of hormonal growth disorders, but also allows to predict the future growth of the child. If, for example, epiphyseal gaps were detected with the help of X-ray, a child's undersized child, a significant already (less) age norm, then growth will stop soon. In a number of cases, this serves as an indication and application of various methods of increasing growth, which are discussed ahead. On the other hand, when a short child is found to have enlarged epiphyseal gaps, there is no reason to worry about his growth, most likely, he will still catch up with peers. The presence of too wide epiphyseal gaps in a tall child suggests that he will have gigantism. So, a person's growth depends on the growth of his bones. But what is the role of hormones in this? The main growth hormone is called growth hormone, or growth hormone. It is produced by a tiny piece of brain - the pituitary gland - the size of which is not larger than the cherry bone, which is located in the skull and is an appendage of the brain. Growth hormone begins to be produced already from the 10-14th week of fetal development. In childhood, its production continuously increases, but in different children it has very large individual fluctuations. This, in part, can explain the fact that children grow unequally. Growth hormone stimulates the division of cartilage cells, an increase in their number and, in part, ossification, that is, contributes to the continuous growth of bone in length, and consequently, the growth of the trunk up. While somatotropin stimulates mainly cartilage, increasing the "material" base of bones and pushing them to uncontrolled lengthening, thyroxine and other thyroid hormones affect mainly skeletal maturation. That is, they contribute to growth precisely due to bone formation. At the same time, it may be unnecessary to explain that if there is too much thyroxine, then the diaphysis fuses with the epiphyses early, the gaps close and the

growth is not stimulated, but stops. Thyroxine, therefore, plays the role of a kind of limiter in the growth process. But with this optimal ratio of growth hormone and thyroxine, they act to increase growth friendly. Male sex hormones - androgens, and, first of all, testosterone, also contribute to increased growth. However, it is a mistake to think that since they are “male,” they are developed only in men. Testosterone is produced in the male and female sex glands, stimulating all phases of bone growth and skeletal formation. The greatest activity of androgens is manifested during puberty, often causing rapid growth in 14-16 years. It is impossible not to mention the hormone of the pancreas - insulin. By itself, it does not affect linear growth, but its exceptional importance in the matter under consideration is that the growth effect of growth hormone (the main growth hormone) is manifested only in the presence of insulin. From what has been said, it may seem that the control of growth processes in the body is offensively simple: a) hormones are produced in the glands; b) they act on muscle, vascular, bone and other tissues and ... c) the individual grows. For the first acquaintance, this, of course, is quite enough. But we should not forget that in reality everything is much more complicated. And if we want to understand why growth disorders occur and how to successfully deal with them, we will have to understand the growth mechanisms more thoroughly. To begin with, the whole vital activity of an organism is manifested through two groups of functions: somatic and vegetative. Somatic actions include actions that a person performs at will: he got up, looked, sang, said, etc. In contrast, vegetation

active functions are carried out independently of our consciousness and will. These are metabolism, cardiac contraction, thermoregulation, the activity of endocrine glands, the processes of development and growth of the body. Despite the fact that vegetative functions lie outside our mind and our desires, their uncontrolledness is apparent. They are controlled by the central nervous system, which for this has a special “formation” of the hypothalamus - the highest center of autonomic regulation. Receiving and processing information from the surrounding world and the internal environment of the body, the perineum system gives commands to the hypothalamus. And he, in turn, controlling the production of hormones, affects the autonomic functions, including growth processes. That is why, as is currently proven, various deviations in the state of the nervous system, disorganizing its work, negatively affect growth. We will return to this issue, and now we will follow the main stages of hormonal regulation of growth, paying attention to the most vulnerable places. Being in the womb, the fetus is already producing its own hormones, the amount of which is gradually increasing. However, the main role in regulating its growth at this stage of life is played by maternal hormones that enter through the placenta. Therefore, physiological, and even more so pathological changes in the hormonal sphere of the mother’s body cannot but affect the growth of the fetus. For normal growth, it is necessary that the concentration of each hormone in the blood and their ratio are maintained at a certain level, and in the process of life, these parameters should naturally change. For example, the concentration of growth hormone from birth to 9 years increases, but in adults it is 3 times lower than in children. At the same time, the concentration of testosterone (the most active of the androgens) in children 11-15 years old is almost 10 times higher than in 10-year-olds. Disba

Lance of hormones, often associated with lifestyle characteristics, diseases, and other sporadic factors, can be the cause of both delays and unexpected growth spurts in children.

On the long hormonal chain and its reliability And what does the whole hormonal chain look like from the highest center of autonomic regulation - the hypothalamus to the cells of peripheral organs that grow under the influence of hormones? Until very recently, they thought this: from the hypothalamus, a signal arrives to the endocrine gland, it secretes a hormone, and it makes cells grow. Now the picture has become much more interesting, and most importantly, more useful for those who are interested in growth issues. Let's try to draw it (Fig. 2). If, according to the central nervous system, the body or its parts need to grow up, it informs the hypothalamus about this. But the latter is in no hurry to give orders to the endocrine glands so that they more likely produce the corresponding growth hormones. Instead, the hypothalamus itself begins to synthesize and secrete its own hormones. What for? So nature came up. The hypothalamic hormones are a kind of mails to the endocrine glands, which say to increase or decrease the production of growth hormones. Everything would be all right, but the route of these “dispatches” goes through very narrow tubules inside the brain. This means that even small brain injuries, inflammation, swelling can close the tubules, which will immediately affect the growth processes. But, let's say, everything is in order - the hormones of the hypothalamus passed through the tubules. Do you think now they give the order to the glands? Not at all. Having passed the tubules, hormones will be in the pituitary gland - the same appendage of the brain that is no bigger than a cherry stone. Further, in the pituitary gland, hormones are formed, of which only somatotropic



I \ IC. 2. Stages of hormonal regulation 4 on the example of the thyroid gland: 1 - CNS; 2 - hypothalamus; 3 - pituitary gland; 4 thyroid gland; 5 - bones, heart, muscles, and rma directly affects the tissue. Other pituitary mammoths serve as yet another intermediate iii i (in the transmission of “dispatches” to the glands of the internal secretion i and after that they begin to produce their growth - I 1

sex hormones. For example, in order for the thyroid gland to secrete its hormone thyroxine, the following steps are necessary: the hypothalamus produces a hormone, under the influence of which another hormone is stimulated in the pituitary gland, which stimulates the thyroid gland, and under the action of the latter, a third hormone is formed in the thyroid gland - thyroxine, which affects growth . Why did we talk about these stages, about how orders to increase growth are transmitted like a baton? Of course, not only because it is interesting in itself, but mainly for this reason. People, especially those associated with technology, are well aware that the reliability of any system depends on the number of links contained in it: the more components in the system, the less reliable it is. This fully applies to a multicomponent growth management system, in connection with which, subsequently, attention will be paid to various ways of protecting it or increasing the reliability of work, or, which, in essence, is the same as preventing stunting. So, we got to the endocrine glands, but the reader is mistaken if he thinks that the journey through the growth mechanisms is nearing its end and the last stage remains - hormone release - growth effect. There are still many stages, at each of them the body can expect surprises. Having received instructions from the appropriate authority, the gland does not always fulfill it. Among the causes of non-performance can be developmental abnormalities, hereditary functional inferiority, tumor processes, infections, intoxications, etc. In short, the gland secretes less hormone than the body needs, or does not secrete it at all. It also happens that iron secretes the hormone enough, and even more than normal, but there is no growth effect. What's the matter? We will try to answer this question, taking as an example the most important hormone - the hormone grew

that one. It is a long polypeptide chain consisting of 191 amino acids that are arranged one after another in a specific sequence. It is enough to change places in this huge chain of only a few amino acids so that somatotropin completely loses its growth effect and turns from a growth factor into a dwarfism development factor even with an excess of it in the blood. But that is not all. Sometimes the full health of the hormone does not guarantee its growth effect. It was established that the action of the hormone that got into the blood does not appear immediately, but after 1-2 hours. It turns out during this time a long chain of growth hormone is broken in the liver by at least 4 shorter chains. It is these chains that elicit the biological effects of somatotrophic hormone in the body. Moreover, the growth effect is associated mainly with a small fragment of 31 amino acids, which occupies places from 77 to 107 in the whole molecule. It follows from the above that if the hormone does not break into fragments, for example, due to liver disease, it can cause irreparable damage to growth. But suppose that the hormone is enough, and it regularly breaks into fragments, but ... The fact is that for the manifestation of the hormonal effect, the presence of active hormones and the tissues on which they act is not enough. To fulfill the command brought by the hormone, the cells of this tissue must perceive the command. To do this, there are special receptors on their surface, which, "feeling" various hormones floating past them with a blood stream, first recognize the hormone that carries the order for this particular tissue, and then fulfill it. This means that there may still be defects in tissue receptors that do not allow the target cells to respond to hormones addressed to them, which for the body is equivalent to their absence in the blood. In connection with this, growth disturbances are also possible. If all the obstacles described above are overcome, only then is a manifestation of a growth hormonal effect possible: enhanced protein synthesis and cell division, an increase in bone length and tissue volume, an increase in the

network of capillaries and individual organs. In a word, only then can an organism grow, if ...

However, we will leave something for later.

HIGH GROWTH AND GENIUS

The fate of the outstanding Russian geneticist Vladimir Pavlovich Efroimsoia (1908-1984) was not very calm. He was subjected to repression twice, the second time - for his bold speech against the ignorant scientific research of academician Lysenko. In the book "Biosocial Factors of Increased Mental Activity," Efroimson investigated the nature of genius. "This book is unique," writes Simon Schnol. "She will be one of the values that remain for future generations from the 20th century." Written in the early 80s, it was published only in 1997/1998. in the journal "Man." Efroimson found out that many brilliant people suffered from various serious diseases of gout, Morris syndrome, and others. In particular, a group of talented geniuses with the Marfan hyperadrenaline syndrome is known. Marfan syndrome is a special form of disproportionate gigantism that is not associated with impaired pituitary gland. It is the result of a systemic defect in connective tissue. When fully manifested, high growth is observed with a relatively short body, huge limbs, arachnodactyly (long arachnid fingers), dislocation of the lens. Extreme thinness and a deformed chest can be accompanied by heart disease and aortic aneurysm. This extremely rare disease (one case per 50,000 people) significantly reduces life expectancy. But with it there is an increased adrenaline rush, which maintains a high physical and mental tone, so it gave humanity several amazing personalities. Of the politicians, A. Lincoln and C. de Gaulle can be named, and of the writers - G.Kh. Andersen, K.I. Chukovsky and, possibly, V. Kuchelbecker. All of them were distinguished by increased performance. Efroimson emphasized that the majority of patients • with Marfan's syndrome do not rise above the average norm or even lag behind it, suffering from the main or any other

additional defects.

DISTURBANCE OF GROWTH AND FIGHT AGAINST IT

According to the abundance of factors, which depend on (IGI growth, are manifold and its disorders. The most formidable of them is dwarfism, denoted by the medical term “dwarfism.” Dwarfism is always a pathology. But where does the border between undersized healthy and healthy, that is, obviously sick? After all, it is known that the limits of the norm are extremely wide. At the same time, it is necessary to identify nanism on the earliest articles, because the sooner treatment is started, the better it is. Especially when you consider that in 18-20 years the growth of IIMYuYUST It doesn't work out and significantly increase the length of time for older people. Men grow below 130 centimeters, and women - I m. dwarf, ”says the managers of the Children's Clinic of the Institute for Experimental • and; rinology and chemistry of hormones AMNSSSR professor m \ Zhukovsky. - Lagging of children by more than 20 m |> <> 1 pt of normal growth for the corresponding industry "II threatens the development of dwarfism, this is crazy .1" k.ii and ggology. To identify it, we, together with Fri PI IMM anthropology Moscow State University Lomonosov's were IIIirtsLottii.i special tables, in which are given the granipia of the normal body length for children from birth to 16 years. Using these tables, medical workers can already at an early stage distinguish the norm from the pathology and refer children with signs of nanism to an in-depth examination and appropriate treatment. However, it is possible to suspect nanism not only by a growth lag ... The uninitiated, perhaps, believe that dwarfism is a disease in which people suffering from it differ from the rest only in much smaller growth. Meanwhile, dwarf growth is just one of the symptoms of a huge number of diseases, various not only in the mechanisms that were discussed, but also in terms of the onset of the disease, the clinical picture, the appearance of

the patients, the nature of the complications and, accordingly, treatment and prognosis. In the vast majority of cases, nanism is caused by hormonal disorders, and their symptoms are sometimes so characteristic that the diagnosis can be made literally at first sight. Given the particular importance that this growth pathology group occupies in the problem of stunting, we will get to know it in more detail.

Growth retardation during hormonal imbalances

Of all types of dwarfism, the so-called cerebral-pituitary dwarfism most often occurs, which, as the name implies, is associated with changes in the brain and pituitary gland. With this disease, there is a lack of somatotrophic function of the anterior pituitary gland, and sometimes its complete loss. Violation of the production of growth hormone by the pituitary gland is caused, as a rule, by damage to the hypothalamic region of the brain. However, such forms of cerebral pituitary nanism are also known in which the formation and secretion of growth hormone do not suffer. In these cases, either somatotropin does not have growth activity due, for example, to a broken sequence of amino acids in its molecule, or peripheral shi "i and IIIIII.Ik'GSYA insensitive to their own ii and ia at the precautionary receptors. 1 and" ii 1 1 1 »1 1 ■ 1 1 1 1 1 qi reading cerebral-pituitary-i'iii i.iiii im. t and tumors occur; g m and gpcheskie processes in the brain miiiiirich III. Mon Hypothalamus. Particularly dangerous are intra- and I " ii.i and '. copies of the fetus associated with the pathology of «and | m mipip <n and mother's ailments, as well as fetal injuries in childbirth. I "m) Ilyu-pituitary dwarfs can give birth to and idor parents. At birth, they have normal size and body weight. For 2-3 years they are I and v and sometimes no different from healthy children. , but then 11 hours of yin and i suddenly slows sharply. In the examination of vyi and and and the delay in bone development and ossification

of the skeleton and K < \ and do not interfere and begin treatment, these Ht m them \ < protected children body proportions even then, "■ and" dp will become adults. In spite of child growth • »body proportions, intellectual development of pituitary glanders. dwarfs are not violated, among them there are AI and IS very talented people. Inheritance, as a rule, is not transmitted. In so-called primary nanism, children are born and on time, without any signs of premature and ii but very small sizes: body length is 20-1 ". m. body weight - 500-1500 g. And the small growth remains for them • for their entire life. It is among the patients of this mon dwarfism that adults, growth and. and orih does not exceed 38-40 cm. The development of their body shiast a certain completeness: timely and and g v. sweating points of ossification and secondary sexual and .and. packs. Girls have menstruation and retention. and regular cycle, pregnancy is possible, when ■ o "II born child can grow sovereign. nio healthy and normal growth., I and patients with primordial nanism of the character. the pathology of the internal organs

normal people in miniature. Therefore, individuals with this form of nanism are usually classified as “healthy dwarfs”. Their mental development depends on the degree of brain damage and is often not disturbed. It is believed that the underlying cause of the disease is damage to the genetic apparatus and impaired embryonic development (genopathy and embryopathy). The genetic nature of the pathology is associated with the fact that close relatives of such children have cases of stunting and various abnormalities: an underdeveloped lower jaw, asymmetry of the body, mental underdevelopment, etc. Toxicosis of the first and second half of pregnancy in mothers, oligohydramnios, defects and placental insufficiency. Children from such births have reduced body weight and height. Another form of dwarfism - thyrogenic nanism is caused by congenital or developing thyroid insufficiency at an early age. In this disease, growth and developmental retardation occurs against the background of severe hypothyroidism and is associated with a significant deficiency or absence of thyroxine, the main thyroid hormone. This may be due to: malformations of the thyroid gland (aplasia), impaired synthesis of thyroid hormones in it due to genetic defects of enzyme systems, insufficient intake of iodine in the body with food. In addition, hypothyroidism can occur due to a decrease or cessation of the production of the anterior pituitary gland of a special thyroid-stimulating hormone that stimulates the activity of the thyroid gland. Finally, the cause may be the defeat of the hypothalamus, which produces a special hormone (thyroliberin) that regulates the secretion of thyroid stimulating hormone by the pituitary gland. Latest options on

In children who have suffered a brain injury, meningitis, and other diseases of the central nervous system, meningoencephalitis and similar diseases. And the lack of pituitary hormones often leads to

..... and pituitary disease: (involvement in the central nervous system) is characterized by changes in the mental and somatic- • • • • • and I Metabolism and work of their organs. In these cases, the organs are impaired, ossification processes are slowed down, with and (there is degeneration of the epiphyseal cartilage, in the 'and.' To the linear growth of the child is inhibited. With thyroidism, children with congenital hypo-hyperemia usually at birth they have a large mass (over 4 kg), which is caused by tissue edema, and in the external and external they take the form typical of cretinism patients with hypothyroidism: small, stupid facial expression, large tongue, saddle-shaped nose, swollen body, dry, cold skin. In addition to the above, there are many other forms of nanism associated with endocrine pathology, which are described in special literature. Turning to the question of helping patients with various forms of dwarfism, it should be said that until relatively recently medicine did not have effective means of combating growth disorders. The tumultuous river of endocrinology drinking in the last two decades has extraordinarily expanded and will in many ways change present! about the nature and causes of dwarfism, allowed. I give fundamentally new effective means and singing. As a result, the ability of medicine to help patients has increased. Perhaps this is most clearly seen in the example of success in the fight against the most widespread form of dwarfism - cerebral-hypophysis dwarfism. As said above, this form of nanism is connected with. I give with an insufficient amount of growth hormone - somatotropin in the body or the absence of its activity. For many years, attempts have been made to use growth hormones of various animals (cattle, small cattle, birds, fish) to treat people.

ended to no avail. This was explained by the fact that growth hormone has species specificity, that is, only human hormone acts on a person. And now, a few years ago, we learned to receive just such a hormone. It received the official medical name "human growth hormone" and is now produced at the Kaunas Endocrine Plant. Perhaps, after reading the previous paragraph, some readers will rush to pharmacies in order to solve their problems with the help of a miraculous drug. Do not hurry. The drug "human growth hormone" comes only in specialized medical institutions, where they are treated under strict medical supervision. Treatment of cerebral pituitary dwarfs with this drug has shown its high efficiency. The annual increase in body length is from 5 to 12 centimeters, which allows you to enter the patient within the limits of normal growth. Treatment begins after the age of three, when growth retardation occurs. Correction of the body length is possible up to 18 years, that is, until the closure of bone growth zones and ossification of the skeleton. The introduction of growth hormone at the end of ossification does not affect the length of the body. The duration of treatment is currently 1.5-2 years. Longer use of the drug is impractical, since antibodies to the patient begin to be produced in the patient's body, and the effectiveness of the treatment is reduced. The formation of antibodies is explained by the relative heterogeneity of the drug being produced, the presence of impurities that do not meet the standard of pure natural somatotropin. However, in laboratory conditions, pure human growth hormone has already been obtained from the culture of *E. coli* by genetic engineering. Apparently, this industry will soon be established.

lenny about SHODI gio, and then there will be an opportunity ud- iiiii.iiii. | x i * i p wider boundaries. Chln \ "h <nii'.i various forms of dwarfism are used i ii ii ip iii preparations. For example, taking into account the validity of irmi-pov and, in particular, testosterone for acceleration of и i i iin * other growth and skeletal maturation, there were nrip./i II synthetic anabolic steroids: cg i NAMI; rice gendiol, retabolil, silabolin. I used 11 instant preparations in combination with somatotropin da-AO Zhprpippe results. I managed to achieve 11 impressive successes even with iiii.6c with a formidable once thyroid disease. Very effective in this form of car- .iiii.i> post turned out to be thyroid preparations produced by our industrial-ikn gyu. They make it possible to compensate for thyroid insufficiency, as a result of which this form of dwarfism is practically not found today, as well as cases of thyrogenic cretinism. The development of dwarfism is caused, as a rule, by disturbances in the work of not one, but several kelez of internal secretion, interconnected functionally, and in some cases (for example, in the pituitary gland) and anatomically. Therefore, modern treatment includes the complex use of various endocrine drugs. Along with hormone therapy, biostimulants, vitamins, special diets and physiotherapy are widely used. In the fight against dwarfism, the prevention of this serious ailment is of great importance. We will describe in detail the means of preventing stunting in the following sections, here we will focus only on two questions. This is primarily an effective treatment for pregnant women, especially if they have endocrine diseases. Treatment should be carried out with such drugs and in dosages that would not harm the fetus. By the way, in this regard, self-medication is completely unacceptable.

The use of another tool is aimed at reducing the likelihood of brain injuries in children during childbirth. It is not by chance that we dwell in such detail on a description of the causes, symptoms, treatment and prevention of the most common forms of nanism. The fact is that between the norm and pathology, undersized and dwarfs there is no clear border, it is conditional. In real life, there is a whole gamut of growth failure options from “a little bit” to clearly sick people who need urgent treatment. Talking in detail about dwarfs, we sought to show extreme cases of pathology, implying that its elements in an erased form may underlie the short stature of some "normal" people. Familiarity with the problem on such demonstrative examples will allow those who are interested in growth issues to better understand and evaluate their condition or the condition of their loved ones. This, in turn, will help if necessary in a timely manner to contact specialists who can provide assistance. But the conversation about stunting does not end there. We move on to the next section of growth disorders and the fight against them.

Growth retardation in neurosis, colds and other diseases

According to the observations of the famous American pediatrician Dr. B. Spock, children grow up worse in dysfunctional families. Why? Conflict situations that a child is constantly forced to encounter at home deeply traumatize his psyche. A continuous source of negative emotions creates a focus of stagnant arousal in his brain, called the dominant (dominant).

According to the teachings of academician A.A. Ukhtomsky dominant - the currently dominant focus of excitation in the central nervous system, which has

increased sensitivity to irritation and inhibitory effect on the work of other nerve centers. In other words, having formed, the center of negative emotions, on the one hand, is supported and enhanced by even unpleasant unpleasant emotions in other circumstances, and on the other hand, it interferes with the work of the nervous system. As a result, its regulatory influence on the whole organism is disorganized, and first of all on the most finely organized sphere - the emotional one. There is a state of psychoemotional stress. It is accompanied by a disorder in the work of the highest center of autonomic regulation - the hypothalamus, which is in charge of such important body functions as blood circulation, digestion, thermoregulation, and the constancy of the internal environment. The hypothalamus also directs the work of the endocrine glands, in the activity of which, under the influence of stress, there is a mismatch. Some of them start eating too many hormones into the bloodstream, others too little, and others, unable to withstand the stress, are generally exhausted. All this is not indifferent to growth, which, as we know, is very sensitive to fluctuations in the internal economy of the body. However, episodic stresses, as a rule, do not yet affect growth, and if they are stopped in time, the child can grow and develop normally, managing to recover between the next “shakes”. It is another matter if stresses continuously follow each other. Then, under the influence of the above and some other changes in the body, a child develops a constant feeling of internal tension and peace of mind. Sometimes he cannot be freed from an oppressive state, becomes irritable or upset, his sleep, appetite is disturbed, his structure worsens, and his performance decreases. Doctors ascertain neurosis, this is very serious. With prolonged disorganization of the central nervous system under the influence of negative emotions and

the deep changes associated with them in the autonomic and endocrine spheres, the internal organs and, in particular, the endocrine glands are involved in the pathological process. In this case, we are already talking about common therapeutic diseases, which are increasingly referred to as the so-called psychosomatic, thereby emphasizing that they are based on the described mechanism of stress and neurosis. These diseases include: bronchial asthma and diabetes mellitus, thyrotoxicosis and gastric ulcer, obesity, dermatosis and even malignant tumors. The latter is connected, in particular, with the fact that under stress immunity is suppressed. Naturally, such serious disturbances in the body do not bypass growth, and often becoming the cause of its persistent delay. How to be? There are at least three ways to help, and it is better when they work together. First of all, it is necessary to eradicate the primary source of stress and neurosis. If parents are guilty of them, their direct duty to the children is to moderate their ardor and do everything possible so that peace reigns in the family hearth. Moreover, not only growth suffers in children ... In addition, a child, especially with severe forms of neurosis, must be treated both for a disease of the nervous system and a psychosomatic, in particular, endocrine. Therapy of such patients is completely in the competence of doctors and includes a wide range of effects from medications to spa treatment. Finally, there is a remedy, which, as they say, is always at hand and which the child can use either independently or on the advice and guidance of adults. We mean physical education. The essence of their prophylactic and restorative, and, in essence, therapeutic action for stress and neurosis is as follows. Non-forced physical activities always deliver

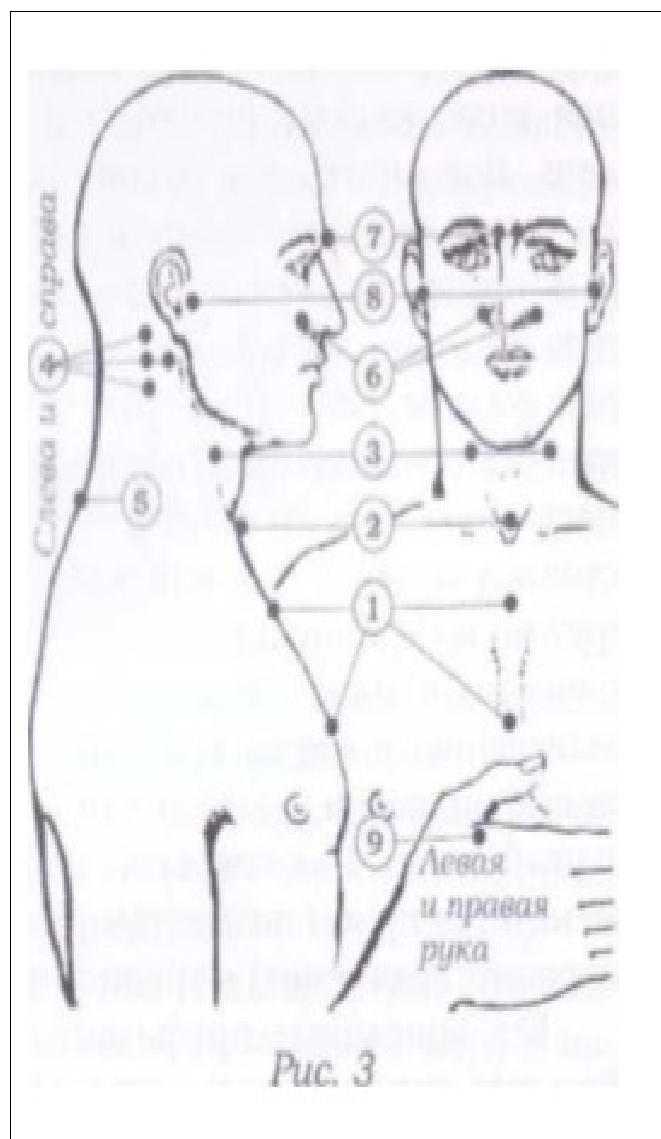
pleasure, that is, painted with positive emotions. For example, swimming in hot weather, cycling or playing football. With a sufficient duration (over 20-30 minutes) and periodicity (3-4 times a week) of these loads, a new focus of excitation arises in the brain, acquiring the character of a dominant. This new dominant can gradually suppress the focus of stagnant arousal associated with negative emotions, thereby opening the way to recovery and growth. That, with psychosomatic diseases, disturbances in the work of internal organs, combined with growth retardation, are understandable and understandable. But after all, most diseases of internal organs (therapeutic diseases) arise outside of a direct connection with the psyche and neuroses, but nevertheless, their growth also slows down. Why? There are many reasons, the main one is that a decrease in the function of one organ or another immediately worsens the living conditions of the whole organism, of all its systems, including the nervous and endocrine. Growth, as an integrative function of the living, is sensitive to all deviations and disturbances in the coordinated work of all parts of the body. But if diseases of internal organs inhibit growth, does it not follow from this that their treatment has a positive effect on growth? Exactly! Numerous studies have convincingly proved that as the child recovers, the growth of the child is normalized. That is, the treatment of the underlying disease is at the same time an effective means of struggle (stunting. Currently, medicine has a huge arsenal of drugs that can successfully treat most diseases. Once the incurable diseases of the heart, blood vessels, lungs, kidneys, liver and other organs recede under the onslaught The latest highly effective drugs. The modern diagnostic and treatment equipment has unusually expanded the capabilities of

whose purposeful care is for the sick. So, timely access to medical institutions provides not only the preservation of the health of children and the younger generation, but also solves the growth problem in most cases. A small addition should be made to the above. The success of treatment and the speed of recovery in diseases of the internal organs largely depend on the reserve capabilities of the body. Their mobilization, strengthening and development are inextricably linked both with the mood of the patient himself and with his sensible training of the compensatory mechanisms of organs and systems. Training, consisting of special complexes of physical exercises, allows you to strengthen the heart muscle and improve vascular tone, improve renal blood flow and metabolism in the liver. These trainings, unlike regular trainings, are physical therapy and are performed according to special programs in medical institutions. With their essence, they once again prove the healing effects of physical exercises on health, and besides ... And besides, they should be considered as the first step to a full recovery. In order to move (of course, with the consent of the doctor) as physical health improves, from physical therapy to systematic exercises simply by physical education. But does the most common disease on Earth, the common cold, affect growth? It turns out that it not only affects, but often becomes the provoking factor with which growth lag begins. Therefore, an ordinary cold deserves to get to know her better in the chapter on growth disorders. What is commonly called the common cold is qualified by doctors as an acute respiratory disease (ARI). The direct cause of ARI is bacteria or viruses that infect mucous membranes.

shells of the respiratory tract (nasopharynx, trachea, bronchi). Depending on the agent that caused the disease, a different clinical picture is observed: with a predominance of a runny nose or cough, headaches or general malaise, fever or muscle pain, sleep disturbances or joint damage, complications are possible. The defeat of the body during acute respiratory infections by one or another disease-causing agent occurs in different ways. It can arise as a result of infection from an already crippled person, as, for example, in the case of flu, or it may be the result of rapid reproduction and introduction into and. and pi of those bacteria or viruses that lived for a long time on the mucous membranes of the host without harming it (for example, herpes virus, staphylococcus, adenoviruses, etc.). In both cases, for the occurrence of acute respiratory infections, the presence of microbes alone is not enough, it is also necessary to reduce the resistance to them (the organism, weakening its protective, immune forces. As factors weakening the resistance of the infection, we can name the body's hypothermia, overwork, long-term negative emotions). Pip, an inferior, vitamin-poor diet. To understand why colds are terrible and what needs to be taken in order to minimize their harmful effects, consider the changes that are taking place in the body with acute respiratory infections and cause the symptoms known to everyone. The place of introduction and nose of the stay of viruses and bacteria throughout the illness are the mucous membranes of the respiratory tract. Their inflammation causes a runny nose, cough, sputum production. However, the main danger for ori_inism is not in the defeat of the mucous membranes and not in it, which is actually associated with their inflammation, but in that, on the 11th, rapidly multiplying and dying in the mucous membranes ► Microbe shelves secrete toxins and various waste products. The latter are carried with blood flow throughout the body and cause profound changes in the activity of various organs and systems. Being the most powerful stress for the body, acute

respiratory infections cause inhibition and exhaustion in the nervous and endocrine systems, in connection with which weakness and discoordination develop. At the same time, the body's defenses are reduced, which leads to the emergence or exacerbation of a variety of chronic diseases. They are usually spoken of as complications: on the ears, heart, kidneys, joints, etc. Many are aware of complications because they appear during or shortly after a cold. Much less often, they notice the connection between the common cold and its effect on the growth of children. But if you understand, then in the mechanisms of complications after a cold on the ears, for example, and on growth there is no fundamental difference. In fact, reduced immunity, vascular, inflammatory, toxic damage to the departments of the hypothalamus or endocrine glands responsible for growth processes can lead to growth inhibition. The situation is exacerbated by the fact that with the depletion of the body's defenses, the likelihood of repeated colds increases with all the ensuing consequences of a vicious cycle. What is the treatment tactic? First of all, you need to see a doctor, regardless of the apparent "ease" of the disease. Modern medicine has a huge range of drugs that can successfully treat colds and prevent their complications in each case. In recent years, on the path of the invincible flu, a reliable barrier has been created in the form of a highly effective influenza vaccine. In short, today you can successfully fight a cold and its complications, but under one indispensable condition: if the treatment is carried out under the guidance of a qualified doctor. But, in addition to therapeutic measures that are within the competence of the doctor, the patient can improve his condition, relieve the severity of the disease and its complications by applying a series of simple preventative measures. These include the method of acupressure developed at the First Moscow Medical Institute by Dr. A.A. Uman. Due to the novelty and utility, this method is recognized as an invention.

(copyright certificate No. 793577). What are its advantages? In simplicity and efficiency. Judge for yourself. There are only 9 points (Fig. 3), and they are easy to find: when pressed with a finger in the area indicated in the figure, the desired point responds with pain. The whole procedure takes 2-3 minutes, can be performed anywhere independently, without requiring special equipment. And finally, testing the method on a large contingent of workers of a number enterprises showed its high efficiency, the incidence decreased several times, and if the disease did occur, its course was much easier. To prevent colds, it is enough to massage the



points with a fingertip using rotational movements, first clockwise, then against 3-4 seconds in each direction. It is better to start with light pressure, gradually increasing the intensity of the impact. Zones 3-4 massage with a gentle movement of the fingers from top to bottom. The procedure is performed in the morning and evening before bedtime, acting on the points through which the ref-

the links responsible for the immunological defense of the body, increasing its resistance: thymus, pituitary gland, sympathetic nervous system are lectured. Points of increased pain can be affected every half hour until the disappearance of pain. Another important aid is drinking relatively large amounts of liquid (milk, mineral water, jelly, compote, juice, tea), up to 2-3 liters per day. Additional fluid increases blood volume and thereby reduces the concentration of microbial toxins in it, reducing the harmful effects on the nervous system, blood vessels, muscles, and endocrine glands. The disease proceeds more easily, the likelihood of complications is less. To combat increased vascular permeability, they drink aronia juice (1-2 glasses a day), green tea, take vitamins P (rutin) and C (ascorbic acid). Tea with raspberries or honey, linden decoction is useful as antitoxic and antipyretic drugs that help to eliminate harmful microbial waste products from sweat. To cover the deficiency of vitamins, it is recommended to take multivitamin preparations (undevit, aerovit, decamevit) in a triple daily dose. All the described preventive measures are all the more important, the more severe the ARI is. It is necessary to carry them out, in coordination with the attending physician, every day until the temperature normalizes, he feels better, and the main symptoms of the disease disappear. In explaining the mechanisms of action of the common cold, we repeatedly repeated: “toxins”, “toxic products”, “toxic substances”. We focus on this in order to make it easier for the reader to understand the inhibitory effect on the growth of the following group of factors, which, like microbial toxins, strike at key points of the physiological systems of the body. This group is actually toxic substances. They are

I'm sorted by origin, by the way they contact the host, and even by the prevailing relation to them. them, MP.IPI Iулин they are in that they poison orpiii im, and. and km ig before him, can lead to a disease-in-growth). There are millions of IIMII II.111 (IIR, K ■, formed during the operation of industrial parts> <! Ii MI and transport, pollute the environment. <And. III M <11i.iiю the danger of toxic damage by them • II thematic ingestion of substances , i i i iпiч <for the so-called bad habits: i \ пр 111к ■ м and alcohol consumption. About the influence of these ve i i i i 11.i i i health and n, in particular, on the growth processes of f i and i and and and i i i im , enough, so that here we are limiting - 111mi i IMMI.M. н.iiпiпiiyiiim And our country is doing ii мiнпiи ГAvi Пмpi.бы <• with pollution of the environment and ■ I.I и: i и к мр * • i кч i and I have bad habits. In the near- * мiiiiiшг IMДI.I п / km. Even more has been done. For people, especially, I and HI I П iмiпi.им и и III THERE ARE HEALTHY AND SAME ik.drki и and, i will be more likely to be in the fresh air and iiiiiiimiiii vi voluntary self-poisoning. And we will also dwell on disturbances of growth, i I and other nutritional deficiencies. I'm van dumb in growth - a straight line. Mm, what does the lack of food have to do with it, and even more so, a * * other reader asks. "At least not in... I rank e hunger over forever. I'm done with a youth, but ... Not everything is as simple as. . • i at first glance. You can, for example, eat dos iai mi and look, eat a lot and nevertheless starve if i. II. let's say poorly absorbed. There are many reasons for which a person, eating, it seems, i rmalyyu, is actually constantly malnourished. On this i pc, he develops the so-called alimentary mirophy, a disease that in all respects corresponds to III I i pain in the absence of food. The causes of nutritional dystrophy are often mechanical, physiological or biochemistry.

changes in the gastrointestinal tract affecting the intake, digestion and absorption of food.

However, starvation can also occur in cases where an insufficient amount of certain substances comes from food. These primarily include proteins and vitamins, moreover, high-grade proteins containing essential amino acids that the body cannot synthesize itself. In a patient with alimentary dystrophy, weight decreases, muscle weakness increases, apathy occurs and, of course, growth is inhibited. Timely access to a doctor allows you to normalize the nutrition of such patients, restore health and then catch up with lost growth. There are growth disorders associated with a lack of certain substances in food. This applies, in particular, to iodine deficiency, in which thyrotoxic goiter and stunting occur. A different picture of growth retardation will be with a lack of mineral elements in food: zinc, iron, cobalt and some others. The reason for the growth lag may also be an excess of certain substances in food, especially salts of heavy metals: lead, mercury, and tin. And in these cases, modern medicine can reliably diagnose a particular disease and provide the person with the necessary assistance. In a word, there are many factors influencing heredity. How to minimize their negative effects on growth to a minimum or completely neutralize, a special system of physical exercises, methods of self-hypnosis, how to eat properly for those who decide to grow up, will be described below.

SOME ANTHROPOLOGICAL DEFINITIONS

Total body size. The dimensions of the body, characterizing its size, or extension along the largest axes, are called total. Distinguish weighted and spatial total body size. By weight include, in particular, the mass (weight, kg) of the body, to the space venous - volumetric (body volume, m³), surface (body surface, m²) and linear (body length and chest perimeter at the

level of the fourth rib with the sternum, cm) dimensions. Anthropologists have developed scales for determining the size of total body sizes. One of them, proposed by Martin to determine body length, has a nine-point rubrication (Table 3). Table 3

Conditional scale of body length (cm)

Body length	Men	Women
I. Small		
1. Dwarf	up to 129.9	to 120.9
2. Very small	130.0-149.0	121.0-139.0
3. Small	150.0- 159.0	140.0-148.9
II. Average		
4. Below average 1	60.0-163.9	149.0-152.9
5. Average	164.0-166.9	153.0-155.9
6. Above average	167.0-169.9	156.0 -158.9
III. Large		
7. Large	170.0-179.9	159.0-167.9
8. Very large	180.0-199.9	168.0-186.9
9. Giant	Over 200	Over 187.0

Body proportions. The proportions of the body are understood to mean the ratio of the projection diameters of the individual parts of the body oriented in different planes (trunk, limbs, their segments, etc.). The proportions of the body depend primarily on the ratio of skeletal sizes, and only a very small effect is exerted on them by the thickness of the subcutaneous tissue and the degree of development of muscles and posture. As decrees- n.ip V.V. Bunak, trunk length, humeral diameter and upper dimensional indices can fluctuate within 5–30 mm (in rare cases and more) if the length of the skeletal parts is the same, due to the differences in the thickness of the tissue covering the skeleton , as well as the degree of bending of the spine, fixing the belt of the upper extremities and

Conditional

the position of the axes of the segments of the lower extremities. It should be borne in mind that all body sizes are in some physiological relationship with each other: with an increase in one size, others will inevitably increase, but to a different degree, which is determined by the laws specific to the group or individual. The most profound and detailed coverage of the problem of patterns of human growth and development was received in the writings of the outstanding anthropologist V.V. Bunaka. V.V. Bunak developed a classification of body proportions, including 9 types (Table 4).

Classification of types of body proportions

Shoulder width	Foot length		
	small	medium	large
small	arrostoid (weak)	hypogarmonoid	teinoid (elongated)
medium	hypostyphroid	harmonoid	paratheinoid
big	stifroid (compacted, strong, dry, compressed)	paraharmonoid	gigantoid

From this table it is clear that the arrostoid type has short legs, narrow shoulders; harmonoid - medium on the length of the legs and the width of the shoulders; gigantoid - long legs, broad shoulders, etc.

This classification is the most perfect. However, it does not exhaust the whole variety of body proportions, because additional variations of dimensional characteristics (pelvic width, length of individual segments, etc.) are revealed, which make it possible to distinguish a number of subtypes. The mathematical apparatus of research, in particular, factor analysis, is of great help in this.

the active use of which can help create new classifications of the types of proportions of the human body. Body constitution. In modern human morphology, constitutional diagnosis is the most complex and ambiguous because the progress made in recent years in this section of anthropology is too small. At the same time, according to the famous anthropologist V.P. Chhetsova, a constitutionology that requires the synthesis of the achievements of various branches of biological science, should take its rightful place in the system of anthropometric knowledge.

AGE DYNAMICS OF BODIES OF CHILDREN AND ADOLESCENTS

The problem of age-related dynamics of the morphological features of the human body is one of the most important in modern anthropological science. Knowledge of the laws governing the development of children in different age periods is very important for establishing the sequence of stages of their growth, studying physique, and physical development. In domestic and foreign literature there is a large number of studies of the general laws of growth and physical development of children and adolescents. However, there are very few works devoted to the study of the age-related dynamics of individual body sizes, the features of the laws of their variability and interconnection. Meanwhile, these data are of undoubted interest for studying the above morphofunctional characteristics of the body, since it is known that morphological characters are more stable and more constant than functional ones, activating the living phases of life processes in the body. It is well known that the development of a child proceeds 11 uniformly with respect to the growth of the whole organism and its parts. In some age periods

growth is particularly intense, but there are periods of slow growth. The processes of acceleration of development begin and end at the same time in different departments, as a result of which at different age stages of the development of the organism, unequal ratios of its morphological elements are observed. The uneven growth and developmental fluctuations noted by many researchers are a reflection of the complex biological laws that regulate the activity of the body, mainly related to the function of the nervous and endocrine systems and various biochemical processes. We do not set as our goal to give an analysis of these complex processes, but restrict ourselves only to considering data on the age dynamics of certain body sizes. The following section addresses the following issues:

1. Human growth and constitution.
2. Change in body size during growth in both sexes.
3. The relationship between the values of anthropometric signs at a particular age and their final value.
4. The increase in size per unit time, ie growth rate and intensity and differences in age dynamics of individual sizes in both sexes.
5. The variability of body size at different age periods.
6. The relationship of body size during the growth period.

Human growth and constitution. Body length.

We start by measuring growth, since this parameter is most often determined and allows us to illustrate various methods of studying metric features. The measurement method is a conventional device for measuring growth - a vertical scale with a transverse moving along it

rail, which falls on the head. The measured person takes off his shoes and, having straightened up, stands under the rail with his back to the scale, so that the heels are shifted together and the visual axis is horizontal. To smooth the effect of stoop on the measurement result, the researcher should take the measured head behind the ears and apply upward pressure to it.

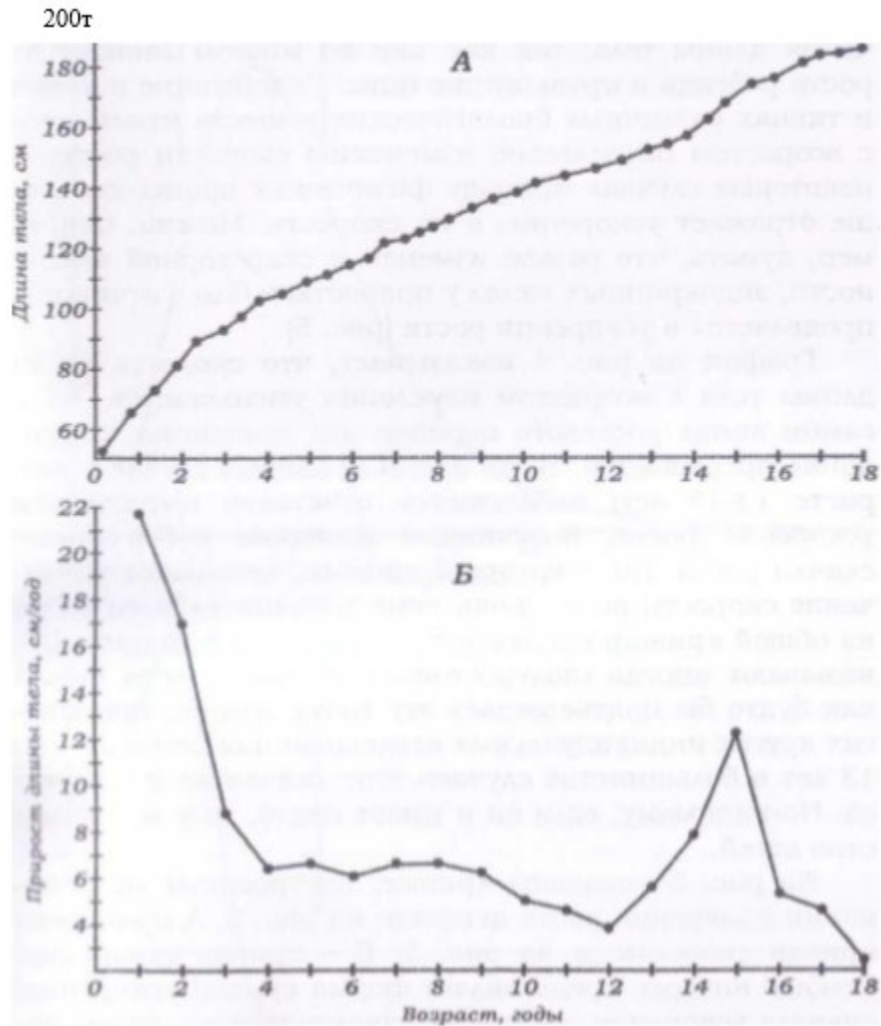
Measuring growth is very simple, but anatomically this is a complex sign, including the size of the legs, pelvis, spine and skull; the contribution of each of them is not the same for different individuals. A person's height gives us some general idea of the size of his body, but in the latter case, body weight would be the best indicator, since it depends on the transverse dimensions. It is clear that some people are tall and thin, while others are tall and fat. The relationship between height and weight, or between height and one of the transverse dimensions, can serve to assess body variability. The empirically established fact that body weight exceeding the average body weight at a given height correlates with a shorter life expectancy put forward this dependence as one of the important factors. The relationship between growth and other anthropometric indicators can be represented in the form of a correlation table (Table 5). Making various measurements with a large group of people, we can subjected the results to statistical analysis to determine whether a large value of one of the indicators, say high growth, is associated with a large or small value of any other indicator; in the first case, they speak of a positive correlation, in the second, negative. A convenient measure of this relationship can be a correlation coefficient, which takes values from +1.0 to -0.1. it is not surprising that the length of the legs and torso is characterized by a high correlation with growth, while the correlation of growth and transverse body sizes is much lower. Body weight, as one would expect, is characterized by a high positive correlation with all other sizes. Table 5

Averaged correlation between body size in young men aged 17 years

	Standing Height	Sitting Height	Arm Length	Leg Length	Thigh Length	Abdominal Circumference	Thigh Circumference	Shoulder Circumference	Weight
Standing Height	-	0,732	0,677	0,864	0,608	0,321	0,490	0,386	0,627
Sitting Height	0,732	-	0,421	0,498	0,201	0,173	0,417	0,384	0,548
Arm Length (from Hand to Shoulder)	0,677	0,421	-	0,683	0,447	0,266	0,483	0,363	0,466
Leg length	0,864	0,498	0,683	-	0,817	0,312	0,424	0,304	0,556
Thigh length	0,608	0,201	0,447	0,817	-	0,515	0,440	0,234	0,525
Abdominal circumference	0,321	0,173	0,266	0,312	0,515	-	0,667	0,526	0,709
Thigh Circumference	0,490	0,417	0,483	0,424	0,440	0,667	-	0,562	0,785
Shoulder Circumference	0,386	0,384	0,363	0,304	0,234	0,526	0,562	-	0,681
Weight	0,627	0,548	0,466	0,556	0,525	0,709	0,785	0,681	-

Human growth curve. The study of growth is extremely important for elucidating the mechanisms of evolution, since the evolution of morphological characters is always carried out by changing the genetically determined growth of a person, since many of these differences are due to differences in the relative growth rate of individual parts of the body. In fig. 4 shows a growth curve of a boy's body length; measurements were taken every 6 months from birth to 18 years. The upper graph shows the absolute dimensions of the body in the corresponding years, on

*I * is. 4. The growth of a person's body length from birth to 18 years (according to J.*



Tanner)

is lower — an increase in body length from one age to another. If we imagine the growth process as some form of movement, then the upper graph will give us an idea of the path traveled, and the lower one - of speed. It is clear that the growth rate better reflects the state

the child at each given moment than the absolute values of the length of the body, since they

largely depend on the child's growth in previous years. The content in the blood and tissues of various biological substances changes with age in parallel with the change in growth rate. In some cases, the nature of physical processes better reflects acceleration rather than speed. One might think, for example, that a sharp change in secretory activity, endocrine glands in adolescents is more clearly manifested in accelerated growth (Fig. 5). The graph in fig. 4 shows that the growth rate of body length decreases steadily with age, but at the very end of the growth period, this trend unexpectedly interrupts. At this time (in this case, at the age of 13-15 years), a pronounced growth acceleration is observed, called the puberty growth spurt.

According to some reports, a slight increase in the growth rate (the appearance of an additional tooth on the general curve) is observed between 6 and 8 years. It is sometimes called the "half-growth" jump. Although rice. 4 as if confirms this point of view, in many other individual studies of children from 4 to 13 years old in most cases this jump is not detected. Apparently, if it does, then a minority of children. In fig. 5 shows curves plotted based on a girl's height measurement; in fig. 5a shows the velocity curve, and in fig. 5, B - acceleration curve. Of particular interest is the shape of the acceleration curve: first, the acceleration gradually increases, then a period of negative acceleration begins, and finally, a gradual decrease in negative acceleration occurs. Points I and II indicate the beginning of swelling of the nipple region and the onset of the first menstruation, respectively. The exact coincidence of the first point with the maximum of positive acceleration, and the second with the maximum of negative, is striking.

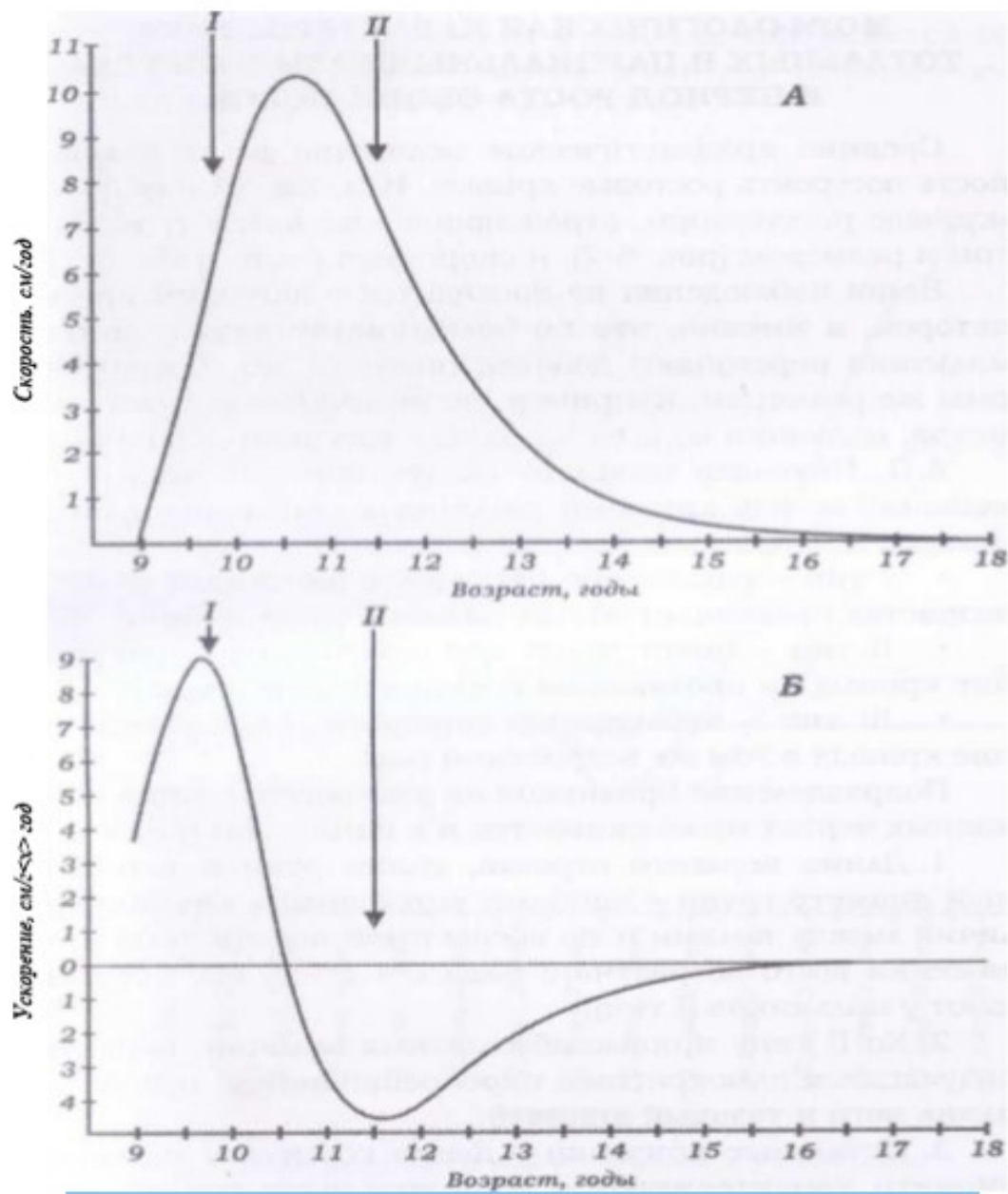


Fig. 5. Curves of speed (A) and acceleration (B) of the growth of a girl's body length from 9 to 18 years (according to J. Tanner): I - the beginning of the development of the mammary glands; II - the age of the first menstruation

MORPHOLOGICAL CHARACTERISTICS OF TOTAL AND PARTIAL BODY DIMENSIONS DURING BOTH FLOORS GROWTH

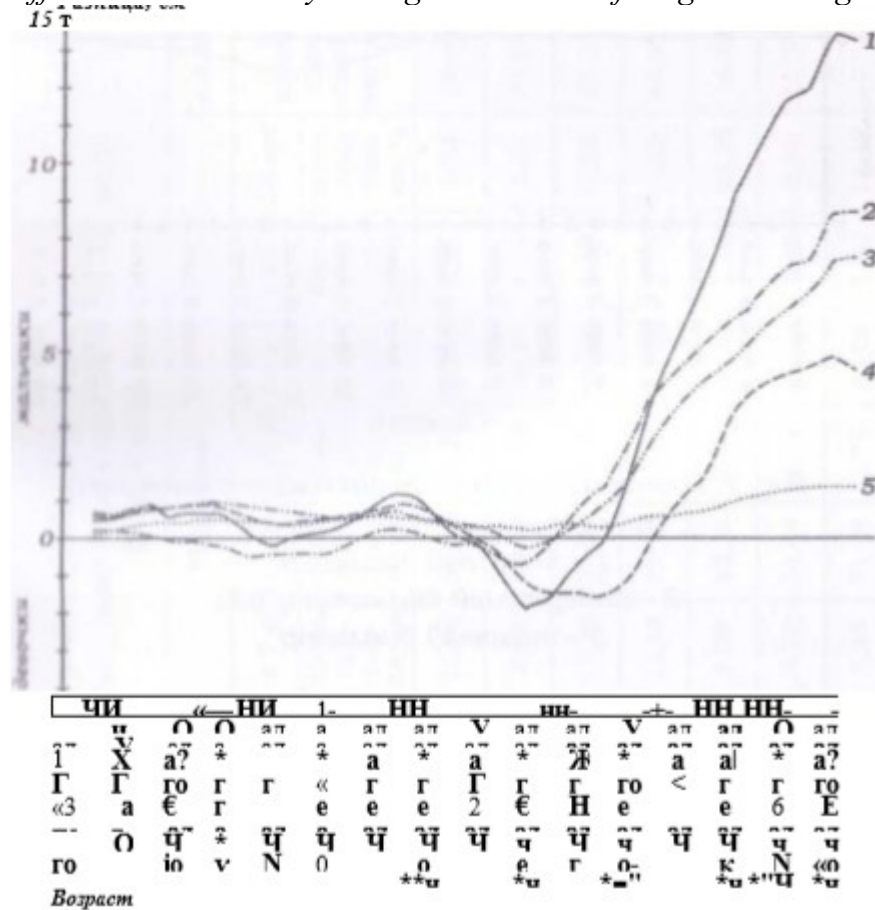
Arithmetic mean values make it possible to build growth curves. Or, as they are called, “distance curves” reflecting the relationship between age and size (Fig. 6-7), and growth rate (Table 6-7). Our observations are not at odds with the data of other authors, namely, that in most body sizes, boys surpass girls after 12 years, in some sizes, for example, in pelvic diameter, boys are inferior to girls at all ages. L.P. Nikolaev distinguishes the following three types of relations between the curves of various signs in boys and girls:

- Type I — any size in one sex at all ages exceeds the same size in the other sex;
- Type II - there is a single crossing of the curves during the study period;
- Type III - there is a double crossing of the curves in the same age series. The subdivision of attributes into the mentioned types in basic features can be traced in our materials.

1. The length of the upper segment, arm length and the transverse diameter of the chest are the most stable in terms of differences between the sexes and in absolute value throughout the entire age range from 4 to 18 years prevail in boys (type I).
2. Type II curves of absolute values, characterized by a single crossing, include leg length and pelvic diameter.
3. Other signs - the length of the body and the shoulder diameter are characterized by the presence of two cross-curves (type III).
4. For various signs and for different years of the study, the first cross, which indicates

about the beginning of puberty in girls, it takes from K) to 11.5 years, the second - characteristic for puberty of boys from 12.5 to 17.5 years.

I ^ ic. b. The difference between boys and girls in terms of longitudinal signs, cm: 1 - body



length; 2 - leg length; 3 - arm length; 4 - body length; 5 - the length of the upper segment

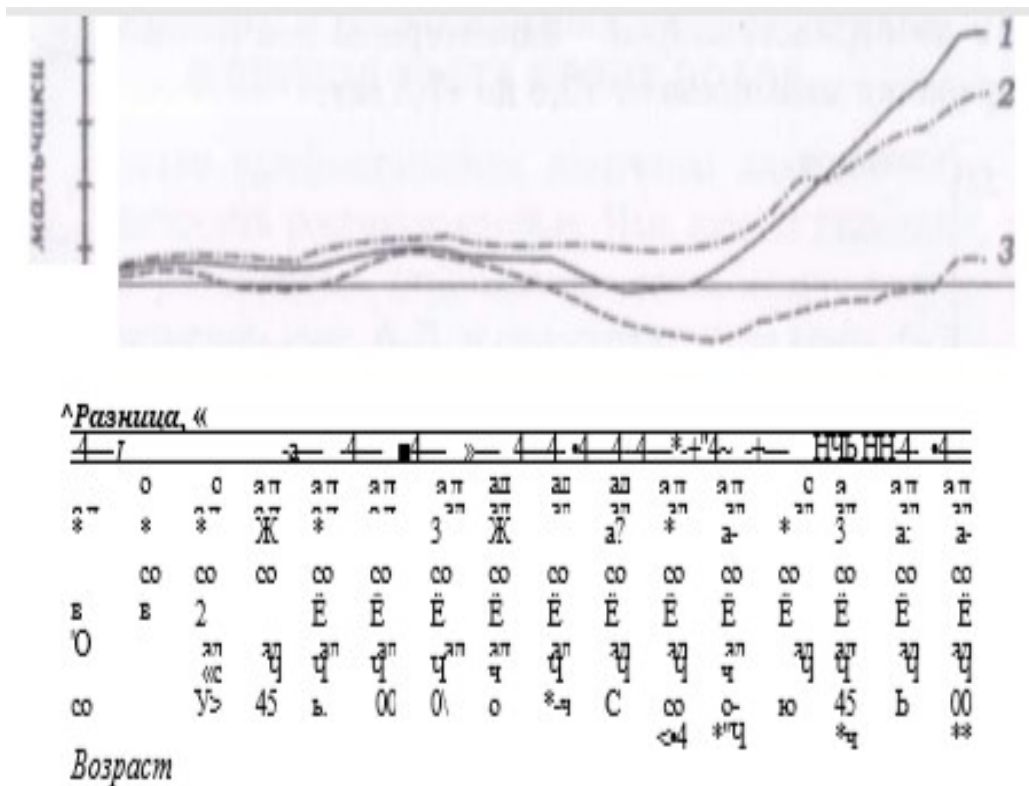


Fig. 7. The difference between boys and girls in terms of diameter, cm:

1 - shoulder diameter;

2 - transverse diameter of the chest;

3 - pelvic diameter 1

1 For all signs, the maximum difference in size between boys and girls occurs after growth (17-18 years) in favor of boys. The exception is the pelvic diameter, according to which the greatest differences between the sexes are observed at the age of 12-13 years in favor of girls. Our observations do not contradict the prevailing beliefs that the age-related characteristics of the growth and development of children have some differences among different sexes, which can be traced to one degree or another throughout the entire growth period.

[illegible]

Таблица 7

н о л м о)
о о а у о

И	К						о о а у о		АН-
	о м до	о м до	о м до	о м до	о м до	о м до	о м до	о м до	
И	абсол. при- ки, см	отн. пр- ба, %	абсол. при- бавки, см	К	О	абсол. при- бавки, см	отн. пр- ба, %	абсол. при- бавки, см	отн. пр- ба, %
1	21,47	15,21	21,79	15,21	15,21	21,79	15,21	21,79	15,21
И	6,97	7,61	7,61	7,61	7,61	7,61	7,61	7,61	7,61
1	9,68	6,49	10,43	6,49	6,49	10,43	6,49	10,43	6,49
И	14,50	7,60	14,02	7,60	7,60	14,02	7,60	14,02	7,60
И	2,60	4,03	4,39	4,03	4,03	4,39	4,03	4,39	4,03
И	2,60	3,80	3,43	3,80	3,80	3,43	3,80	3,43	3,80
И	2,60	2,69	2,61	2,69	2,69	2,61	2,69	2,61	2,69

As you know, puberty and the associated acceleration of growth processes in girls begin “much earlier than in boys (by about 2 years). Their growth during this period proceeds more intensively, the first intersection of the curves occurs, and as a result of this, over a period of time, different for different characters, the sizes of girls are larger than the sizes of boys of the same age. In the future, a period of faster growth begins for boys, while for girls, growth processes are already taking place at a slower pace, and the growth curves of boys cross the curves of girls - the second cross. After the second crossover, boys are significantly larger than girls in absolute sizes.

Body size growth rate

One of the main characteristics of the growth process is the growth rate, which most strikingly reflects the age dynamics. The most profound and detailed coverage of the problem of patterns of human growth and development was received in the writings of the outstanding anthropologist V.V. Bunaka. V.V. Wumak in absolute growth distinguishes three main phases, separated by two inflection points. Under the phase is meant the “segment during which the increase in size occurs the same way, i.e. the increase in size either gradually increases, or decreases- oi, or retains approximately one level; a sharp change in growth means the transition of one phase to another - within one phase, changes occur gradually. " Thus, we can say that phases a rasterize the features of the growth process. The moment of transition of one phase to another is called the inflection point.

Ascertaining a three-phase type of growth in humans, V.V. Bunak notes that in the first phase there is a rapid drop in the growth rate, in the second phase the rate is either close to stable or gradually increases, and in the third phase a lower level of growth is characteristic. The greatest value V.V. Bunak attaches to the middle phase (second), puberty occurs throughout its length. The middle phase is called puberty, and V.V. Bunak notes that “the emergence of a middle phase with a slowed-down drop in intensity, or even a slight increase in it, which shifts the first phase with a rapid decrease in the growth rate, lengthens the development period and ensures its uniformity”. Three-phase curve established by V.V. Bunak for annual increments can be traced on our material both in the case of total body sizes and partial, but in modern material there are some shifts in age dynamics. For a comparative analysis of the growth patterns of signs of unequal size in different sexes and different years of study, we did not use absolute growth increments, but relative (or standardized, as defined by V.V. Bunak), expressing the absolute increase in fractions of the trait at 18 years of age. The progress of growth processes is clearly visible on the table. 6-7 and fig. 67. The analysis of growth rate curves allows to determine the phases of slow growth, average growth and growth jump

Longitudinal dimensions

The growth rate of body length and most longitudinal sizes decreases from birth to completion of the growth process. In this case, there are two periods of increase in the growth rate, which we conventionally call the first and second maximum growth rates, and

the moment of the minimum growth rate before acceleration begins, leading to the appearance of a second maximum (the latter is called in the literature the “peak of growth rate” or puberty jump). Based on this, it is possible to establish the beginning of the growth shift (increase in the growth rate), its top and end. The first maximum growth rate is observed between 4 and 7 years of life, while the increase in individual characteristics is different. The second maximum, or “peak growth rate,” which is known in foreign literature as the “puberty jump,” precedes puberty. Both sexes exhibit either two velocity peaks or one strongly stretched in time. The nature of the growth rate curve seems to reflect a large variability in the onset of puberty in various children. J. Tanner, a well-known English anthropologist, believes that the puberty jump in growth varies in intensity and duration in different children and that “in any group of boys 13-14 years of age we will see a huge developmental variability, represented by almost all transitions, from complete Iripeles to the puberty stage. In girls, as in boys, there are significant variations in the time of onset of pubertal growth intensification, and the sequence of processes remains quite constant ”(meaning the development of secondary sexual characteristics).

Body length

According to our materials, the first break is a gradual decrease in the growth rate of the body length, i.e. the first h is maximum, occurs at the age of 4 to 5.5 years for young children and at 6 years for girls (Table 6-7, Fig. 8-9).

to \\\tT season concepts, the period of the most intensive pop) growth. The maximum falls at the age of 10-11.5 years,

about 3-4 years earlier than boys. During puberty growth, relative increases in girls exceed those in boys; Thus, in girls, the increase in body length over a six-month age interval is 1.92-2.07%, and in boys 1.61-1.77%. However, in general, both sexes have less growth than in the first years of life. The absolute length of the body length in boys in the pre- and puberty periods increases more than in girls, and the growths in the former are 47-48 cm, and in the latter - 37-38 cm. As a result of this difference between the sexes during the period of intensive growth of the girls is less than in puberty jump time in boys. After reaching the peak of speed, a rapid decline in the growth rate and its attenuation are observed in boys after 18 years, in girls after 16-16.5 years. According to D. Tanner, the actual cessation of the increase in body length falls on average for boys by 17% of the year, and for girls 16% of the year. After this age, the increase in body length does not exceed 2%. The length of the body consists of various components: the length of the body, including the upper segment, and the length of the legs. Therefore, when studying growth, it is necessary to take into account the individual components. For them, as well as for the entire length of the body, the uneven growth processes is characteristic (Table 6-7, Fig. 8-9). The growth of various longitudinal sizes does not go in parallel, they grow at different rates, reaching a peak in speed and ending in growth at the same time, which leads to different proportions of the body in different age periods. In this case, it is possible to outline a certain sequence in time of the beginning of acceleration and the achievement of a peak in velocity for individual signs (Table 8). The upper segment begins acceleration first, then the length of the body and, finally, the length of the leg. Arm length occupies a somewhat intermediate position. To achieve a peak in velocity, the opposite

sheniya. First of all, limbs reach the peak of speed, first lower, then upper, and then the upper segment and the body. Table 8

Signs	Start Acceleration	Maximum
The boys		
Body length	9.5 years	13.5-14.5 years
Upper segment length	7.5 years	14-15.5 years
Body length	8.5-9.5 years	14-14 years
Leg length	9-11 years	11.5 -14.5 years
arm length	7-10.5 years	12-14 years
Girls		
Body length	8.5 years	10-11.5 years
Length of the upper segment	7-9 years	10-11.5 years
Body length	7.5-8.5 years	10.5-12.5 years
Leg length	8.5 years	10 , 10.5 years
Arm length	7.5-8.5 years	10-10.5 years

However, for the length of the limbs, the puberty peak of the growth rate is not clearly expressed, which is especially noticeable in boys. The limbs are characterized not only by a higher growth rate, but also by its large value - the growth rate curves for the length of the limbs pass at a higher level on a significant segment of the age curve of postnatal human development. For the length of the upper segment and the entire body, the increases during the pubertal growth shift in boys and girls are approximately equal, for the length of the limbs during this period, the increases in girls are large. As well as for body length, in all longitudinal sizes, after reaching a peak in the growth rate, its sharp decline and attenuation are observed - in boys after 18 years, in girls after 16-16.5 years. For boys, over the entire studied growth period, the body length increases by about 42%, in girls - by 37-37.5%. There is a known sequence in

the increment of individual longitudinal signs for the entire growth period. The lower extremities grow most intensively, their length increases by 47-48% in boys and by 42-43% in girls; then the upper limbs, respectively, by 44% and 38-39%; the length of the hull is 34-35% and 31% and, finally, the length of the upper segment is 21-23% and 17-20%. The overall increase in size in girls is relatively smaller than in boys. Throughout the entire growing period, girls exceed boys of the same age in the relative magnitude of all longitudinal signs. Our data confirm the statement of D. Tanner that girls at all ages are morphologically more mature than boys.

Growth Match Indices

To analyze the relationship of individual sizes during the growth period, i.e., the characteristics of their age-related changes, V.V. Bunak offers a growth correspondence index, in which the relationship of characters is characterized by the ratio of their relative, or standardized, speeds at each given age. Signs that have the same relative growth rate are called isodynamic - the index in this case is 1. Signs characterized by different relative growth rates are heterodynamic, while the growth correspondence index is less than or greater than 1 - negative or positive heterodynamics, i.e. any sign grows either more slowly or faster than another. The growth correspondence indicator, positive or negative, constitutes a stable characteristic of linear proportions, independent of absolute dimensions. Our materials confirm what V.V. Bunak position on the change in the indices of correspondence of growth with age and the presence of the so-called

growth gradients. V.V. Bunak attaches great importance to them and considers them to be the most important characteristic of the growth process, since growth gradients serve as indicators of changes in the direction of the growth rate from one part of the body to another. In the early stages of postnatal human development, right up to the puberty, the lower limb grows faster than the body.

The relationship between body size during growth

One of the methods for characterizing the relationship between body sizes is the correlation method. It is known that the development of the whole organism and its individual parts and organs is determined by the general laws of growth and the presence of the so-called group and local factors affecting various signs. Correlations to a certain extent allow you to catch the actual relationship between the signs, get an idea of a greater or lesser relationship between them. The unity of communication and independence is a correlation in the mathematical sense. The correlation coefficient serves as an indicator of the relationship between the signs - it is 0 in the absence of connection and 1 - in the case of functional connection in the mathematical sense. When calculating the communication indicators, we proceed from the premises of the so-called "normal distribution" of signs and the straightforward nature of the relationship between them. If the dependence is not quite straightforward, or not at all straightforward, the value of the correlation coefficient decreases or is completely lost. V.V. Bunak concludes that in a group that is homogeneous by sex, age, occupation and tribal affiliation, size correlations reflect the group-specific growth conditions of individual body parts, d. A regularity of the physiological order. The correlation of individual characteristics varies in magnitude.) th difference is related to the features of development of individual

parts and organs and, in the opinion of B. B. Bunaka, reflects the polymorphism in the structure. Correlation coefficients allow you to establish the changes that occur in the body during growth. In the age dynamics of correlation coefficients, high and low indicators are observed. The maximum value of the correlation coefficients is ascertained during the puberty period; in subsequent ages, their value decreases continuously and approaches the value of the correlation coefficients characteristic of an adult by the age of 18 years. The relationship of sizes is similar in both sexes, however, some differences are also observed: 1) age-related fluctuations in correlation coefficients, as a rule, are more pronounced in girls; 2) puberty increase in correlation coefficients in girls is noted two years earlier, as well as a more or less stable decrease in the value of correlation coefficients in the last segment of the age curve. Thus, the correlation coefficients, along with other indicators - the intersection of growth curves of absolute values, growth increments and variation coefficients, reflect the earlier onset of puberty in girls.

PROBLEMS OF SPORTS ANTHROPOLOGY

The morphological status of a person largely determines his functional capabilities, which ultimately affect the predisposition to various types of activity. This general concept is more realistically expressed among athletes acting, as a rule, in extreme conditions associated with the manifestation of maximum performance. Therefore, individuals with certain body indices turn out to be more than others promising to high achievements in specific sports.

At the same time, a number of scientists express the idea that the progress of sports leads to a decrease in differences in physique and overall performance of athletes, the convergence of their main morphofunctional indicators. This trend arose, according to the authors, in connection with the education in all sports of comprehensively developed athletes who do not have noticeable differences in body structure, but have a high level of special performance. It is not possible to agree with such conclusions, since this contradicts the laws of the interdependence of form and content, structure and function. That is why specialists in anthropological studies are guided by the presence of high dependencies between morphological characters and sports specialization, as well as the fact that the various ratios of these characters indicate the density, massiveness and shape of the body and ultimately determine the physical capacity of a person to a much greater extent than functional tests. Numerous literature data indicate that representatives of various sports differ not only in total body sizes and proportions, but also in some constitutional features, the ratio of fractional values of body weight (muscles, subcutaneous and total fat, skeleton) - Fig. 10. However, often in competitions the winners are people who far from correspond to the supposed best somatic type for this type of sports activity. In such cases, the influence of many factors affects, and, first of all, such as the level of physical, technical, tactical, theoretical and volitional fitness of the athlete. Nevertheless, such situations are an exception. In addition, when identifying group features, proposals from representatives of various specializations

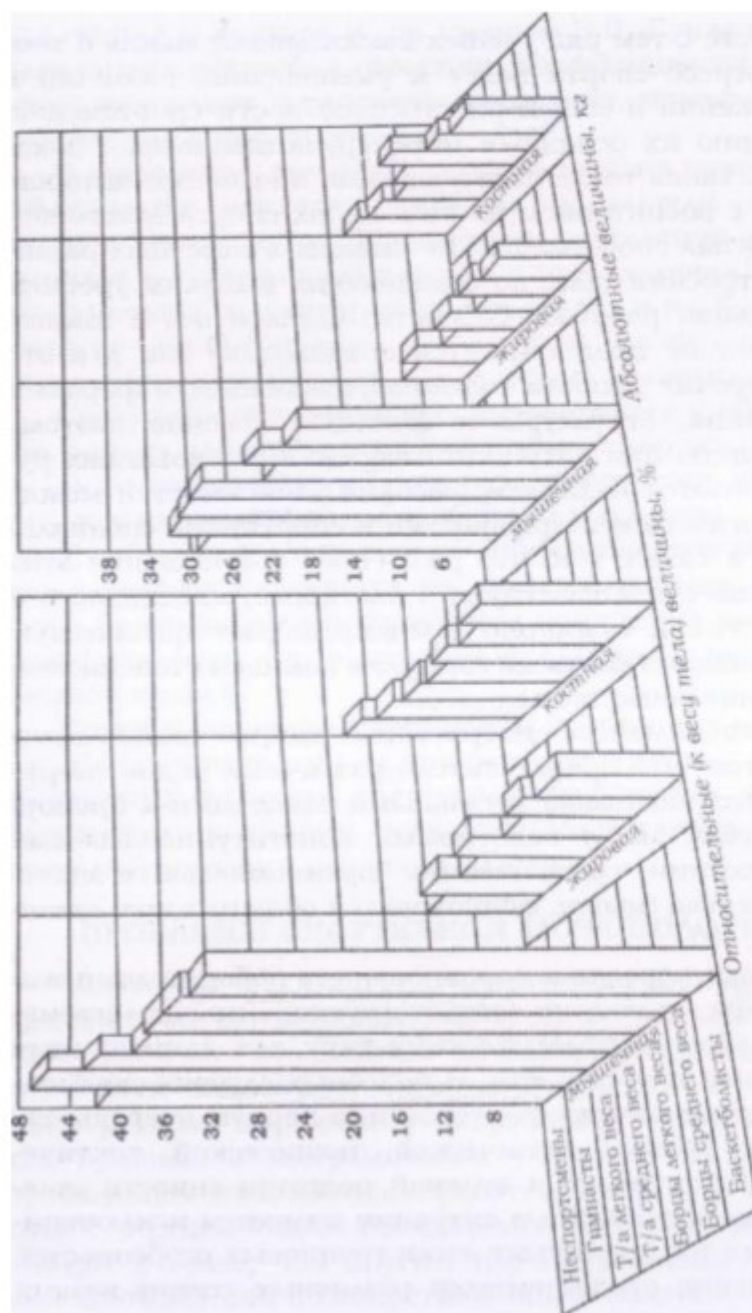


Рис. 10. Компоненты веса тела представителей некоторых специализаций.
По абсциссе - группы испытуемых, по ординате - абсолютные и относительные массы мышечной, жировой и костной ткани, по аппликате — шкалы усредненных величин

individual options lose their value as random variables. These exceptions are of particular interest in connection with the study of compensatory morphofunctional relationships. They allow you to get an answer to the question of how appropriate this option is. This is in good agreement with the conclusions that increasing the rate of child growth before the onset of puberty is crucial for the final body size of adults and that children are no longer growing up during puberty than in the past. The puberty growth acceleration is occurring now a year earlier than in the past, and the length and body weight indices for 11-13-year-old children are greater than for children of this age in the past, with two to three annual growth. As for the historical trends of the phenomenon of acceleration and some predictions for the future, then it is advisable to summarize the following: D. Tanner summarizing the results of studies by American, English and Swedish authors, notes that for the period 1880 to 1970, in each decade, the growth gain in children averaged about 1.5 cm, and the goal weight was about 0.5 kg. This tendency also occurs in our cabbage soup. Acceleration is characterized by periods of accelerated and delayed development. Slowdowns associated with epidemics, wars, economic crises are very strong and long. There are different opinions regarding the further course of acceleration: Professor J. Tanner suggested that by 2010 young people will reach a length of probably 200 cm. In all likelihood, acceleration will continue at least until then, and to the differences in the living conditions of generations will not be eliminated. The most significant influence on the pace of biological development at the level of one generation is (ii) under the same social conditions > \< geographic environmental factors and genotype.

These data should systematically interest specialists in sports, since the accelerated physical development of modern children is accompanied by accelerated puberty, early onset of ossification of the skeleton, and later extinction of sexual functions. The existence of such regularities in the growth dynamics of children made it possible, using the methods of multiple regression analysis, to compose equations in which the length, body weight and thickness of the fat fold in the subscapular region appear, in order to predict the constitutional type of young Europeans and Negroids. True, it should be noted that the problem of children's constitutions remains one of the most controversial in modern constitutional science. The main focus of works on children's constitutions concerns mainly the distribution of somatotype frequencies and their subsequent age dynamics. The selection of children for a special training, the purpose of which is to establish high sports achievements, is directly related to determining the optimal pace of individual development of athletes, especially in adolescence. Grimm has evidence that young men who have true harmonic and later development often specialize in sports that have strict requirements for speed and much less muscle strength and endurance. He revealed, while studying boys from 9 to 15 years old, that among children with accelerated development endomorphic types are more common; they turned out to be large and indicators of muscle strength. At the same time, puberty reaches its peak in boys of the mesomorphic type about a year earlier than in boys of the ectomorphic type. An important addition to this are the conclusions of S.S. Groshenkova and S.I. Lyasotovich that now in connection with the “rejuvenation” of record holders, it’s necessary to select earlier, which means that

only passport, but also biological age. These factors underline the particular importance of taking into account the rate of biological development of children selected for sports. However, these rare and isolated attempts by scientists, and moreover, performed, as a rule, in static studies, cannot satisfy the demands of sports practice on the problem of initial selection, the main essence of which is the choice of reliable tests. Much should be expected from many years of dynamic research on a large contingent of subjects, from the first days of life to 20-25 years of age. In the meantime, in order to correctly solve the problems of initial selection, it makes sense to use the available materials about the physique of outstanding athletes and take into account the prospect of the physical development of future athletes based on the study of their genetic condition (i.e., focus on close relatives). The fact that an individual predisposition to practice a particular sport influences sports achievements convinces us that selection in various sports sections should be carried out according to the morphological characteristics of those involved. So, V.V. Based on a study of a large number of athletes, Bunak established 16 types of body proportions, combining them into three groups:

1. A slender body (jumpers, runners, skiers).
2. A voluminous, wide body (throwers, weightlifters, wrestlers).
3. The middle type (swimmers, all-around, boxers, soccer players).

In the analyzed work, there is the author's remark about him, that "the correspondence of somatic and sports Primakovs is not so complete as to recognize structural features as a factor directly determining

physical capacity. ” In this regard, V.V. Bunach notes the need for a closer relationship between functional research and somatic research. He notes that the ratio of body length to the length of the lower limbs is an important indicator for choosing jumpers, runners and weightlifters, and the length of the upper limbs and forearm is for choosing throwers. Consequently, the identification of informative morphological criteria (whether it is indices or simply the absolute values of various dimensional attributes) is an urgent task of sports anthropology. Solving it along with studying the age-related dynamics of the physique and the characteristics of the genetic influence on the individual pace and the absolute results of the physical development of children is of great importance for the problem of the initial selection of children in sports sections. Another problem of sports anthropology is the formation of a certain physique in representatives of specific sports on the way from a beginner to a highly qualified master. The available literature on this issue, unfortunately, is represented by materials on total sizes (and occasionally on the proportions and constitution of the body) of mostly prominent representatives of various sports. A relatively large number of publications is devoted to anthropometric data of students of sports schools, athletes of average qualification. Much less work is devoted to the somatometric characteristics of young athletes. Consequently, the trainer now does not have a full range of morphological data that could be used to guide one's physique during the long-term training of athletes. At the same time, it would be wrong to ignore some materials that are of some value. So, in 1966 there was a law

■ to * but a four-year static examination of more than 15 thousand students of school children aged 11 to 18 years; ■ among them, boys represented 13 sports, demos - 10. Morphological characteristics of 843 subjects from 19 to 24 years are presented (Tables 9 and 10) F.A. Zavichsky. The subjects had many years of experience and various qualifications: 16 masters of sports, 550 first-class students and 277 second-class students. Using the materials in the tables below, it is possible to draw up indicative norms for the morphological characteristics of athletes - representatives of a particular sport in age and qualification aspects. One of the most serious biological tasks in solving the problem of forming a certain physique for representatives of a particular sport on the way from a beginner to an international-class master of sports is the study of shaping factors. I still have an unclear question about the effect of locomotor activity of varying intensity on physical changes in endocrine organs. Nevertheless, there is reason to believe that physical exercises of a certain orientation (“on speed”, “on strength”, “endurance”) determine a specific effect on the hormonal system, regulation and activity of organs and hormones that determine the nature and orientation metabolic processes. The processes of growth, development and renewal of bone and ip are controlled by various hormones, and the quantitative characteristic of bone tissue depends on the wearing of the hormones involved in this. Vigorous and mental exercises have a strong influence on n processes. The value of the exchange “fund” of calcium in • athletes increases sharply, and the rate of osteogenesis increases by 46% compared with healthy athletes who are not involved in sports.

Anthropometric indicators of sportsmen of the highest ranks

(according to F.A. Zavileisky)

Sports Naya	Anthropometric indicators												
	Total body size		Diameters, cm			Perimeters, cm							
	body length cm	weight body cm	shoulders	clean	waist	shoulder		forearm		hips		lower legs	
						right	left	right	left	right	left	right	left
Athletics	166,0±6,0	63,1±7,4	57,2±1,3	28,6±1,6	71,2±5,2	27,9±2,5	27,2±2,5	25,6±1,5	25,1±1,5	59,1±4,0	58,4±3,8	36,8±1,7	36,5±1,7
Gymnastics	158,3±4,2	56,3±4,4	36,0±1,4	27,4±1,2	67,7±3,6	27,5±1,9	26,9±1,9	24,9±1,2	24,4±1,2	56,4±3,0	55,8±2,8	35,7±1,6	35,5±1,4
skiing	161,5±3,8	60,3±4,2	36,5±1,5	28,2±1,1	70,2±3,1	27,9±1,3	27,2±2,5	25,4±1,1	24,8±1,1	57,6±2,6	57,2±2,6	36,4±2,2	36,3±1,6
Swimming	163,9±4,2	61,7±7,2	36,9±1,4	28,3±1,2	70,0±4,1	28,9±2,0	28,2±2,4	26,3±1,4	25,2±1,5	58,7±3,5	58,2±3,6	36,6±2,0	36,1±2,0
Volleyball	164,2±6,2	63,2±7,6	36,3±1,2	28,5±1,2	71,2±4,0	28,5±1,6	27,5±1,5	25,6±1,2	25,1±1,3	59,6±3,4	59,1±3,6	36,9±1,9	36,6±1,9
Basketball	166,1±6,0	64,3±7,0	37,1±1,4	28,3±1,3	70,7±3,8	28,0±2,2	27,4±2,1	25,3±1,3	24,9±1,2	60,2±3,4	59,9±3,4	36,9±2,0	36,7±2,0
Cycling	162,1±5,2	62,0±5,2	36,2±1,2	28,1±1,1	71,4±4,0	28,2±2,1	27,9±2,4	25,0±1,0	24,8±1,3	59,4±2,6	58,8±2,8	36,9±1,3	36,6±1,8

Anthropometric indicators of top-level athletes (according to F.A. Zavileisky)

Sports Naya	Anthropometric indicators											
	Total body size		Diameters, cm		Perimeters, cm							
	body length cm	weight body cm	shoulders	clean	shoulder		forearm		hips		lower legs	
					right	left	right	left	right	left	right	left
Athletics	180,1±7,1	76,2±3,4	40,7±1,4	28,3±1,6	30,3±1,2	29,7±1,0	28,9±1,2	28,0±1,2	57,2±2,6	56,5±2,7	37,6±2,0	37,4±1,6
Gymnastics	168,5±5,6	65,8±4,8	39,5±1,4	27,3±1,3	31,0±1,5	30,8±1,5	28,3±1,1	28,0±1,1	54,3±2,0	53,8±3,2	36,5±1,2	36,0±1,3
skiing	171,3±6,0	68,8±5,6	39,8±1,5	28,1±1,5	29,3±1,6	28,9±1,7	27,8±1,1	27,5±1,1	52,7±3,0	51,1±2,2	37,9±1,3	37,3±1,4
Swimming	174,4±7,0	71,0±7,8	40,4±1,3	28,2±1,5	30,4±1,8	29,8±2,0	28,8±1,5	28,4±1,4	56,9±2,7	55,8±3,8	37,5±1,8	37,2±1,9
Volleyball	177,3±5,0	73,3±6,2	40,5±1,4	28,7±1,1	30,2±1,7	29,4±1,7	28,8±1,1	28,3±1,2	56,9±2,7	56,6±2,8	37,7±1,7	37,6±1,6
Basketball	181,7±7,2	75,6±6,8	40,9±1,7	29,3±1,2	30,1±2,4	29,2±1,5	28,6±1,2	28,3±1,2	57,3±2,9	56,7±2,6	38,2±1,6	38,0±1,5
Cycling	173,7±5,2	73,0±6,6	40,1±1,1	28,6±1,1	30,2±1,3	29,5±1,2	26,7±1,0	28,5±1,2	58,0±2,4	57,6±2,6	38,3±1,7	37,6±1,7

The increase in muscle mass, variations in its quantitative characteristics in athletes of different sports, we can assume are a reflection of hormonal changes. Unfortunately, there is no data on this issue in the literature. The considered problems of sports anthropology, i.e. selection for specific sports according to the characteristics of the physique and the formation of a certain physique during the course of many years of training are closely interconnected and rely on the dialectical regularity of the interdependence of form and content, structure and function.

However, the degree of this interdependence, apparently, can be of a changing nature.

Therefore, morphological examinations of athletes must be carried out systematically, which will reveal historical trends in the dynamics of the physique of representatives of specific sports. Taking these trends into account will make it possible to predict the somatotype of future athletes, and therefore, to make a more competent selection of athletes and purposefully shape their physique. As an illustration, we can cite the dynamics of weight-bearing indicators of athletes in some sports (table. 11). These data indicate, firstly, the specificity and a specific range of weight-gain indicators of representatives of specific sports and, secondly, the tendency to change weight-growth indicators for the analyzed period, which is highly dependent on the growth of sports results. Another problem is the individualization of the training process in accordance with the characteristics of the physique. It is just as important as the two previous ones. The fact is that the discrepancy between the individual athlete's physique and the accepted norms cannot prevent him from pursuing his chosen sport (sports should give joy to those who practice). Therefore, the coach needs to select special options for those students

peak actions. Individualize physical, technical, tactical, psychological training. Table 11

Comparative analysis of weighting indicators of the strongest athletes of the USSR and participants in the Olympic Games in some sports

S P O R T S	S p e c i a l i z a t i o n	Participants of the XIX Olympic Games			Six winners of the XIX Olympic Games			Participants of the XX Olympic Games			Six winners of the XX Olympic Games		
		B o d y g h t Kg	B o d e n g t h	W e i g h t / c m	B o d y g h t Kg	B o d e n g t h	W e i g h t / c m	B o d y g h t Kg	B o d e n g t h	W e i g h t / c m	B o d y g h t Kg	B o d e n g t h	W e i g h t / c m
1 ryzhki n height		61,5	174	400	64,5	176	420	62,5	175,6	356	66,0	178,7	369
100-200m running		56,7	166	340	56,6	169	335	55,8	164,5	339	57,9	166,8	34,7
800mm running		54,7	167	326	52,5	167	314	52,5	166,8	315	56,1	169,2	331
1 ryzhki 1! lengths		58,7	169	458	60,2	170	468	59,8	169,7	352	58,5	168,5	347
Gymnastics		51,2	159	317	50,8	160	312	-	-	-	48,5	159,8	303
1 Miodine bursts		55,0	160	343	56,6	161,2	351	-	-	-	53,6	161,9	331

the strength of the trainer himself, from the ability to drink the pupils' physique features and, with their couple, strictly individualize the training process; and The duty of scientists is to create the most accurate morphological criteria, based on which the trainer would make specific recommendations to the athlete. Now a lot of material has been accumulated about the group features of training athletes of various somatotypes. Less studied, or more precisely, practically not I I I ibotannoy, the problem of sports anthropology is the fourth - orientation in the choice of sports specialization for residents of ecologically polluted zones and group features of preparation for high

achievements in various environmental conditions based on the morphological and functional characteristics of athletes.

INTERACTION OF INHERITANCE AND ENVIRONMENT IN THE PROCESS OF REGULATION OF GROWTH SPEED

Many factors are known to influence the rate of development. Some of them are hereditary and from an early age contribute to the acceleration or deceleration of physiological maturation. Others (for example, malnutrition, season, severe psychological stress) belong to the category of environmental factors and affect the growth rate only during its period of action. Finally, some factors, such as the socio-economic situation, are the result of a complex interaction of heredity and environment. The length of the body, weight, and physique of a child or adult are the result of not only action, but also the interaction of genetic and environmental factors. From a certain set of genes that determine body length, it is very far from the growth of this particular person. In modern genetics, it is considered a common truth that the expression of any gene depends primarily on the internal environment created by other genes, and then on the external environment. Moreover, the interaction of genes and the environment may not be additive. For example, a certain increase in the diet will not necessarily cause an increase in growth, say, by 10% in all people, regardless of their genetic constitution. Instead, genetically tall people will have a 12% increase in growth, and genetically undersized people will increase by 8%. This type of interaction is called multigaming.

Generally speaking, the same environmental conditions can be very suitable for a child with one set of genes and completely unsuitable for a child with another set. Thus, it is extremely difficult to quantify the relative role of heredity and environment in the regulation of growth and physique, not taking into account certain environmental conditions. In general terms, the closer the environmental conditions are to the optimal, the sooner the potential of the genes will appear. However, this is just a general rule, and, no doubt, a lot of more subtle and specific interactions are observed in the processes of growth and differentiation.

ACCELERATION. REASONS, SIGNS, METHODS OF DEFINITION

Acceleration is the acceleration of age-related development by shifting morphogenesis to earlier stages of ontogenesis. The term “acceleration” (from the Latin word “acceleration” - acceleration) was proposed by the German doctor Kos in 1935. The essence of acceleration is the earlier achievement of certain stages of the biological (physical and sexual, etc.) development and completion of the body's maturation. As the main manifestations of acceleration, scientists consider: - the large length and body weight of newborns at present compared with the same values of newborns of the 20-30s of the XX century; Currently, the growth of one-year-old children is on average 4-5 cm, and body weight is 1-2 kg more than 70-80 years ago; - earlier teething of the first teeth, their replacement for permanent occurs 1-2 months earlier than in the aunts of the last century; - earlier appearance of ossification nuclei in boys and girls, and in general, ossification of the skeleton in girls ends by 3 years, and in boys - 2 years earlier than in the 20-30s of the XX century; - an increase in the body length of the current generation is 8-10 cm more than the previous one; - an earlier increase in the length and body weight of children of preschool and school age, and the older the child,

the more it differs in body size from the children of the last century; - sexual development of boys and girls ends 1.5-2 years earlier than in the XX century, for every 10 years, the onset of menstruation in girls accelerates by 4-6 months. Scientists have found that true acceleration is accompanied by an increase in life expectancy and the reproductive period of the adult population. Based on the correlation of anthropometric indicators and the level of biological maturity, harmonic and disharmonic acceleration types are distinguished. The first includes those children whose anthropometric indices and the level of biological maturity are higher than average values for this age group; the second type includes children who have enhanced body growth in length without simultaneous acceleration of puberty or early puberty without enhanced growth in length . To explain the acceleration process, a number of theories have been proposed at present:

Physicochemical

- 1) heliogenous (the influence of solar radiation);
- 2) radio wave, magnetic (the influence of a magnetic field);
- 3) cosmic radiation;
- 4) increased concentration of carbon dioxide caused by increased production.

Theories of individual factors of living conditions

- 1) alimentary;
- 2) nutritional;
- 3) increased information.

Genetic

- 1) cyclic biological changes;
- 2) heterosis (mixing populations).

Theories of a complex of factors of living conditions

- 1) urban influence;
- 2) a complex of socio-biological factors.

Accelerating the physical development of the child requires the rationalization of work and physical activity. In connection with acceleration, regional standards that we use to assess physical development should be periodically reviewed.

Body length

This is the most stable indicator characterizing the state of plastic processes in the body and, to some extent, its level of maturity. The body length of a newborn baby ranges from 46 to 56 cm. It is generally accepted that if a newborn baby has a body length of 45 cm or less, then he is premature. The length of the body in children of the first year of life is determined taking into account its monthly increase. In the first quarter of life, the monthly increase in body length is 3 cm, in the second - 2.5, in the third - 1.5, in the fourth - 1 cm. The total increase in body length for the 1st year is 25 cm. For the 2nd and 3 years of life, increases in body length are 12-13 and 7-8 cm, respectively. The body length of children at 8 years old is 130 cm, for each missing year, 7 cm is subtracted from 130 cm, 5 cm is added for every exceeding year.

Body weight

Body weight, in contrast to length, is a more labile indicator that reacts relatively quickly and changes under the influence of various causes of exo- and endogenous nature. Body weight reflects the degree of development of the bone and muscle systems, internal organs,

subcutaneous fat. Weight the body of a newborn is an average of about 3.5 kg. Newborns weighing 2500 g or less are considered premature or born with intrauterine malnutrition. Children born with a body weight of 4000 g or more are considered large. As a criterion for the maturity of a newborn child, a mass-growth coefficient is used, which is normally 60-80. If its value is lower than 60, this is in favor of congenital malnutrition, and if above 80, it is congenital paratrophy. After birth, within 4-5 days of life, the child experiences a loss of body weight in the range of 5-8% of the original, that is, 150-300 g (physiological decrease in body weight). Then the body weight begins to increase and about the 8-10th day reaches the initial level. A decrease in body weight of more than 300 g cannot be considered physiological. The main reason for the physiological drop in body weight is, first of all, insufficient administration of water and food in the first days after birth. Also important is the loss of body weight in connection with the release through the skin and lungs of water, as well as original feces, urine. It should be borne in mind that in children of the 1st year of life, an increase in body length by 1 cm is usually accompanied by an increase in body weight of 280-320 g. When calculating the body weight of children of the 1st year of life with a birth weight of 2500-3000 g per the initial indicator is 3000 g. The rate of increase in body weight of children after a year is significantly slowed down. The body weight of a child at 5 years old is 19 kg; for each missing year up to 5 years, 2 kg is deducted, for each subsequent year 3 kg is added. To assess the body weight of children of preschool and school age, two-dimensional centile body mass scales for different body lengths are used increasingly as age norms, based on an assessment of body weight by body length within the age-gender groups.

Head circumference

The head circumference at birth averages 34-36 cm. In the future, it increases especially

intensely in the first year of life, amounting to 46- 47 cm by the year. In the first 3 months of life, the monthly head circumference growth is 2 cm, at the age of 3- 6 months - 1 cm, during the second half of life - 0.5 cm. By 6 years, the head circumference increases to 50.5-51 cm, by 14-15 years - to 53-56 cm. In boys, its size is slightly larger than in girls. In children of the first year of life: the head circumference of a 6-month-old child is 43. cm, subtract 1.5 cm from each missing month from 43, add 0.5 cm for each subsequent month. In children from 2 to 15 years: head circumference at 5 years is equal to 50 cm; subtract 1 cm for each missing year, add 0.6 cm for each year that is excess. Monitoring the change in the head circumference of children in the first three years of life is an important component in assessing the physical development of the child. Changes in the head circumference reflect the general laws of the biological development of the child, in particular the cerebral type of growth, as well as the development of a number of pathological conditions (micro- and hydrocephalus).

Breast circumference

The breast circumference at birth is on average 32-35 cm. In the first year of life, it increases monthly by 1.2-1.3 cm, amounting to 47-48 cm by the year. By 5 years, the chest circumference increases to 55 cm, to 10 - up to 65 cm. 1. In children of the 1st year of life: the circumference of the chest of a 6-month-old child is 45 cm, for each missing month from 45, subtract 2 cm, for each subsequent month add 0.5 cm. 2 In children from 2 to 15 years: the chest circumference at 10 years is 63 cm, for children under 10 years old, the formula 109 is used

$63 - 1.5 (10-p)$, for children over 10 years old - $63 + 3 \text{ cm } (p-10)$, where n is the number of years the child. For a more accurate assessment of the circumference of the chest, centile tables are used, built on the assessment of the circumference of the chest along the length of the body

within the age-gender group. The chest circumference is an important indicator reflecting the degree of development of the chest, muscle, subcutaneous fat layer on the chest, which is closely correlated with the functional parameters of the respiratory system.

The surface of the body

The surface of the body is one of the most important indicators of physical development. This feature helps to evaluate not only the morphological, but also the functional state of the body. The body surface has a close correlation with a number of physiological functions of the body. Indicators of the functional state of blood circulation, external respiration, and kidneys are closely related to this indicator. Separate medications should also be prescribed in accordance with this factor. The body surface is usually calculated by a nomogram taking into account the length and body weight. It is known that the surface of a child's body per 1 kg of its mass in a newborn is three, and in a one-year-old, two times more than in an adult.

Puberty

One of the most reliable indicators of biological maturity is the degree of puberty of the child. In everyday practice, it is assessed most often by the severity of secondary sexual characteristics. In girls, this is the growth of hair on the pubis and in the armpits, the development of the mammary glands (Ma) and the age of the first menstruation. In boys, in addition to the growth of hair on the pubis and axillary cavities, 110 nah, the mutation of the voice, body hair and the formation of the Adam's apple are evaluated.

Physical development

The physical development of the child is one of the most important criteria in assessing his state of health. Of a large number of morphological and functional features, various criteria are used to assess the physical development of children and adolescents at each age. In addition to the features of the morphological and functional state of the body, it is customary to verify biological age in assessing physical development. It is known that certain indicators of the biological development of children in different age periods can be leading or auxiliary. For primary school children, the leading indicators of biological development are the number of permanent teeth, skeletal maturity, and body length. In assessing the level of biological development of middle and older children, the degree of severity of secondary sexual characteristics, ossification of bones, the nature of growth processes are of more importance, the length of the body and the development of the dental system are of lesser importance. Various methods are used to assess the physical development of children: the method of indices, signal deviations, score tables, regression scales, and more recently, the centile method. Anthropometric indices are the ratio of individual anthropometric features expressed by formulas. The erroneous use of the indices for assessing the physical development of a growing organism has been proved, since as a result of studies of age morphology it has been shown that individual sizes of the child's body increase unevenly, which means that anthropometric indicators vary disproportionately. The signal deviation method that is currently widely used to assess the development of children in children

and regression scales are based on the assumption that the studied sample corresponds to the law of normal distribution. Meanwhile, a study of the distribution form of a number of anthropometric signs (body weight, chest circumference, muscle strength of the hands, etc.) indicates an asymmetry of their distribution, most often right-handed. Due to this, the boundaries of signal deviations can be artificially overestimated or underestimated, distorting the true nature of the assessment. The centile method, which has recently been increasingly used in pediatric literature, is devoid of these drawbacks. Since the centile method is not limited by the nature of the distribution, it is acceptable for evaluating any indicators. The method is simple to work, due to the fact that when using centile tables or graphs, all kinds of calculations are excluded. Two-dimensional centric scales - “body length - body weight”, “body length - chest circumference”, in which the values of body mass and chest circumference for the proper body length are calculated, allow us to judge the harmonious development. Typically, the 3rd, 10th, 25th, 50th, 75th, 90th, 97th centiles are used to characterize the sample. 3rd centile is an indicator value less than which it is observed in 3% of the sample members; the value of the indicator is less than the 10th centile — in 10% of the sample members, etc. The intervals between the centiles are called centile corridors. An individual assessment of indicators of physical development determines the level of a sign by its position in one of 7 centile corridors. Indicators that fell in the 4th-5th corridors (25th-75th centiles) should be considered average, in the 3rd (10th-25th centiles) - below average, in the 6th (75-90th centiles)) - above average, in the 2nd (3rd to 10th centiles) - low, in the 7th (90-97th centiles) - high, in the 1st (to 3rd centiles) - very low, in the 8th (above the 97th centile) - very high. Harmonious is the physical development in which

body weight and chest circumference correspond to body length, that is, fall into the 4-5th centile corridors (25-75th centile). Physical development is considered disharmonious, in which body weight and chest circumference lag behind due (3rd corridor, 10-25th centile) or more due (6th corridor, 75-90th centile) due to increased fat deposition. Physical development should be considered sharply disharmonious, in which body weight and chest circumference lag behind due (2nd corridor, 3-10th centiles) or exceed the proper value (7th corridor, 90-97th centiles) due to increased fat deposition. Currently, the physical development of the child is evaluated in this order. The correspondence of the calendar age to the level of biological development is established. The level of biological development corresponds to the calendar age, if most indicators of biological development are in the middle age range. If the indicators of biological development lag behind the calendar age or are ahead of it, this indicates a delay (retardation) or acceleration (acceleration) of the pace of biological development. After determining the conformity of the biological age with the passport age, the morphological and functional state of the body is evaluated. To assess anthropometric indicators, depending on age and gender, centile tables are used. The use of centile tables allows you to define physical development as medium, higher or lower, high or low, as well as harmonious, disharmonious, sharply disharmonious. The definition of a group of children with deviations in physical development (disharmonious, sharply disharmonious) is due to the fact that they often have disorders of the cardiovascular, endocrine, nervous and other systems. On this basis, they are subject to a special in-depth examination. In children with disharmonious and sharply disharmonious development, functional indicators are usually below the age norm. For such children, taking into account the causes of deviations of physical development from age indicators, individual plans for recovery and treatment are developed.

RACES AND ECOLOGICAL CONDITIONS

The existence of racial differences in the speed and nature of growth leads to differences in the physical type between adult individuals. Some of these differences are clearly of genetic origin, while others depend on nutrition and, possibly, climate. We must assume that in each of the main populations of the globe, the growth of its members was adapted by the action of selection to the conditions of the environment in which evolution took place. We can see the remnants of this process in modern populations, but only the remnants, since relatively recent migrations have greatly changed the distribution of peoples and many of them no longer live in the areas where evolution took place. Indeed, there is a rather close positive relationship between the “linearity” indicator, which is estimated as the relative weight of an adult (weight in relation to body length) and the average annual temperature of the habitat. Differences in body size should be strictly separated from differences in body proportions, since the first of them compared with the latter quite easily change under the influence of malnutrition. A European who was starving in childhood will eventually be short, but he will not have relatively short legs and a long body, like a Japanese, or long legs and a short body, like an African. The shape of its skeleton will practically not change, but with a sufficiently long and severe malnutrition, the amount of fat and muscles will be sharply reduced.

Age-related body length curves for groups of European, African and Asian peoples of precisely established origin, living in similar and favorable conditions with an almost optimal diet, do not allow to detect any significant differences between blacks and Europeans. As for the Chinese, their body length is shorter and the growth process ends earlier; perhaps this explains their short-leggedness. Unlike the two groups of genetically similar populations living in different environmental conditions, a general growth retardation during malnutrition is obvious.

Contrary to popular belief, climate does not directly affect growth rates. Schoolgirls in Nigeria who receive relatively good nutrition have an average age of first menstruation of 14.3 years, and Eskimo girls for 14.4 years. For Burmese girls receiving excellent nutrition and enjoying good medical treatment, the appearance of the first menstruation fell by an average of 13.2 years. Despite the very hot climate (45 ° C), this figure was practically the same as the average

for European girls. A very interesting and perhaps least studied fisherman, illustrating the influence of the geographical environment on the morphological characteristics of man, is the dependence of some morphological characters on the chemical composition of soils. Research in this direction was organized by the Research Institute of Anthropology of Moscow State University. To date, only six have been studied; cohimic zones, but even in these studies, an important relationship was shown between the content of phosphorus, calcium, aluminum, and iron in the soils with the latitudinal dimensions of pilaf and face, and a positive relationship with the longitudinal diameter of head and body length. The research results suggest that in areas with a large content of chemical • stimulants, the population is characterized. <gay tall,

leggy. In areas with

a byte of silicon - less body length, large sizes of the facial section of the skull. Studies confirm the point that various environmental factors have a definite effect on the size, shape and constitution of the human body. And since far from the same environmental factors act in different parts of our planet, the group characteristics of the physique of people living in different conditions should differ. Along with constitutional differences, many authors note peculiarities of body proportions in individual populations. So, N.A. The barnicot indicates the differences between populations as a percentage of body length to body length. For example, in the indigenous population of Australia and many African blacks the body is relatively short, the feed index ($D^{TM} 3 \text{ gurtitis} < P^{\circ} ST \text{ sid} *$) to 100%), respectively, the body length of the veins is 45 and 50%, while in the Chinese , Eskimos and American Indians, this value reaches 53-54%.

The relative leggy of blacks in comparison with Europeans is also indicated by J. Tanner.

Interestingly, in populations characterized by a relatively large leg length, the tibia-femoral

index

long bones to 100%) tends to

increase to 85% and above. Moreover, with an increased relative length of the tibia segment in these populations, as a rule, a large length of the forearm with respect to the shoulder.

Important for sports practice is the fact that different populations revealed significant differences in the ratios of the three main transverse sizes (shoulder width, hip and bispinal diameters) to body length. These differences can be used as indicators when choosing a sports specialization.

Why did nature create such morphological differences? How justified are they? Are there objective biomechanical advantages in the movements of individuals with a certain physique? In which particular sports should a population have superiority, for example, with long limbs and a large tibia-femoral index? Or what kinds of sports are more appropriate for men and women of the indigenous population of Australia if gender differences in the structure of their hips are less pronounced than in Europeans? The answers to these questions, apparently, can enrich sports anthropology and significantly bring it closer to the needs of sports practice. Thus, the physique-workability relationship, which is based on the dialectical pattern of the interdependence of form and content, structure and function, seems to raise the need to analyze the constitutional predisposition of individual populations to high achievements in certain sports. Most of these studies have been performed in terms of comparing the physique and athletic capabilities of representatives of the black and Caucasian races. The functional differences between the athletes of the Anglo-Americans and the blacks are evidenced by J. Tanner, who directly emphasizes the outstanding physical abilities of blacks to run short distances, throwing and jumping. He explains the structure of the body of the reasons for the success of blacks in hurdling on the m. To this it should be added that over the past three decades, all Olympic champions in running on m with barriers have been blacks. J. Tanner notes that with the same body length with representatives of other races, Negroids have not only longer legs, but also lower body weight (due to the narrow pelvis, shoulders, thin legs and an extraordinary subcutaneous fat layer). These factors cannot help contributing to the achievement of high speeds in hurdling. Thus, the question of the morphological and functional predisposition of certain populations to achievements in certain sports is at the very beginning

of its development. Its solution will contribute to the cultivation of precisely those types of sports for which "on the ground" there are the greatest biological prerequisites. Scientific developments in this regard would allow sports leaders to exhibit teams of teams in those sports that are most acceptable to the indigenous population. An analysis of the four main problems of sports anthropology reveals an extremely insufficient level of their scientific development, which affects the practice of sports. All this indicates the relevance of the issues addressed.

FACTS EVIDENCE AGAINST THERAPY BY GROWTH HORMON

When, in 1990, an endocrinologist from Wisconsin State, Dr. Daniel Rudman, published in the prestigious *New England Journal of Medicine* the results of his studies on the use of growth hormone (GH) by twelve men aged 61 to 81 years, he could not even imagine what a stir this would cause. All subjects observed by Dr. Rudman were united by one thing - growth hormone release deficiency, which was determined by the levels of insulin-like growth factor 1 (IGF-1), produced by growth hormone in the liver and other tissues. After six months of treatment with GH injections, the experiment participants showed changes in the body corresponding to rejuvenation, neither more nor less - for as long as 20 years! Men showed a 10% set of lean muscle mass with a 15% fat loss at the same time. This was accompanied by cosmetic and psychological changes.

Everyone's energy level has risen, one of the men has regained his hair color, while the other has long-lasting wrinkles. It seemed that science had finally found a fountain of youth. Much less publications then were that all the results achieved during the experiment immediately disappeared after stopping the hormone intake, similar to turning the Cinderella carriage after midnight and a pumpkin. To make matters worse, continued administration of growth hormone

for another year after the end of the experiment led to frightening side effects: narrowing of the connective fibers of the hands (carpal tunnel syndrome), which complicates the passage of nerve impulses, as well as gynecomastia, a side effect well known to bodybuilders who exceeded dose of anabolic steroids. (Gynecomastia is expressed in abnormal growth of the glandular tissues of the breast.) Some of the participants in the experiment began to experience severe joint pain. It is unlikely that any of the doctors will object that the levels of GH fall with age. The debate raises the question of whether this should be treated. Women with estrogen deficiency are treated with hormones to avoid menopausal symptoms. In recent years, there has been a growing trend in the number of therapeutic centers that deal with the problem of GH. Now scientists are arguing about the relationship between testosterone and prostate cancer, between estrogen and breast cancer in women, and the attitude towards GR is definite: being a growth factor, it can stimulate the development of unwanted formations, that is, "tumors. Opponents of growth hormone therapy indicate problems associated with acromegaly. Acromegaly is caused by a benign adenoma, or tumor, in the pituitary gland, which is located at the base of the brain. Such a tumor leads to an abnormally high (10-20 times higher) level of growth hormone release. People suffering from this for a long time

disease become very high. For example, Robert Wadlow, with a height of 272 cm, is listed in the Guinness Book of Records as the tallest ever living person. He died at the age of 22 due to an infection in the places of fastening of the bandages on his legs, which he was forced to wear due to weakness of the muscles of his legs. (Myopathy, or muscle weakness, is very common among people with acromegaly.) In addition to the excess growth that occurs if the disease began in childhood, when bone growth zones were still open, acromegalics have huge hands and feet, and facial deformities make them look like Neanderthals. Their usual lifespan is not more than 50 years, most die due to heart disease or diabetes complications. These diseases are believed to be consequences of the overproduction of GR. Acromegaly is the worst case scenario when it comes to the effects of growth hormone. Bodybuilders taking it also experience some side effects. Some develop gynecomastia, although it is difficult to attribute it only to GR, since some anabolic steroids can become the cause. A much more specific effect is carpal tunnel syndrome (narrowing of the carpal tunnel), which many well-known bodybuilders had to fix surgically. But not all cases of the occurrence of this disease are associated with the use of GR, you can get this syndrome if you type too much and generally perform many repetitive movements with a brush or hand. Side effects associated with growth hormone always occur with too frequent or too high doses. Doctors have already realized that the replacement dose of GR is the dose that compensates for the fact that aging men are treated with testosterone. Therapy is based on the results of numerous serious studies that have shown that it can alleviate psychological problems, reduce the risk of developing cardiovascular disease and help in a number of other cases associated with a lack of testosterone. Curiously, the need for testosterone is balanced by the well-known relationship between this hormone and prostate cancer. In fact, many medical theories suggest that it is normal for the body to decrease

testosterone production with age. According to them, it is unnatural to introduce hormones such as estrogen, testosterone and GR additionally. They are vital in the growth stage of the body, but can be harmful during aging. Even the term was coined - antagonistic pliotropy, which the body no longer produces these hormones. The goal of this therapy is to bring the levels of IGF-1 to 50-350 nanograms per milliliter of blood, that is, as in 'youth' age *. (IGF 1 (read by an accurate marker of GR levels, poppy like growth hormone itself breaks down in about 1 hour). The usual doses are no more than 1-2 international units per day. But some professional bodybuilders are rumored to take 12 and more units per day. This can lead to adverse consequences, especially if the period of admission exceeds six months.

Does growth hormone lengthen life?

Probably the most accurate way to determine the effect of growth hormone on life expectancy is to study what happens when it is released too much or too little naturally. As already mentioned, with acromegaly, a tumor in the pituitary gland forces the body to secrete 10-20 times greater amounts of GH. But even in this case, its excess does not manifest itself in any way until 15-20 years. If the disease is not treated, then mortality among such people is two to three times higher. The main causes of death among acromegalics are cardiovascular diseases (39-62%), respiratory diseases (25%) or various types of cancer (9-25%). The key phrase here is "if left untreated." In most cases of acromegaly, doctors note an increase in the mass of the left ventricle of the heart and a slight increase in the size of the prostate, while cases of prostate cancer are quite rare. There is also a slight increase in the growth of polyps in the rectum, but not passing into cancer of the rectum. Almost all of these

the effects are associated with increased secretion of IGF-1, caused by a high level of GH release. However, for most, the problem is not in the excess of GR, but in its lack. This is especially true for older people. Starting from the age of 20, GR levels decrease on average by 50% every seven years, while IGF-1 levels fall by 15% every decade. The rate at which GH levels depend on factors such as the amount of abdominal fat (which inhibits the secretion of GH due to the increased release of fatty acids into the blood), genetics, and exercise. If you have been involved in sports for many years, this will help to slow down the usual drop in GR. The same applies to other hormones, such as testosterone. Although many therapists began to treat estrogen, testosterone or thyroid hormone deficiency without confusion, until recently, the only indication for prescribing growth hormone therapy was dwarfism, and only in children. In 1958, when GR was first obtained in the form of a dosage form, its distribution was limited, since the only source of production was extracts from the pituitary glands of corpses. As a consequence, a problem arose, since it was found that some pituitary glands served as a refuge for deadly organisms.

Growth Hormone and Fat

Correction of GH deficiency causes some other changes in the human body. For example, patients with GH deficiency weigh more than other people, basically

Mr., due to fat. Excess fat is deposited in parallel with a decrease in lean body mass. Its main part is located in the waist area, which in turn leads to the development of insulin resistance and a fivefold increase in the incidence of cardiovascular diseases. People with GR deficiency also show a 10% decrease in bone mass, which can lead to an increase in osteoporosis. As already noted, excessive deposition of fat in the abdominal region leads to insulin resistance and a decrease in glucose tolerance. People with growth hormone deficiencies are also prone to blood lipid disorders that can cause a variety of heart and vascular diseases, including lowering HDL (good cholesterol) and high ANP (bad cholesterol) levels. As a result, they are more likely to have atherosclerosis. HDL (high density lipoproteins) are proteins that carry cholesterol in the blood. They protect us from heart disease, helping to remove excess cholesterol from the bloodstream. LDL (low density lipoproteins) are associated with the occurrence of such diseases as a result of their oxidation in the blood. Growth hormone helps control fat in several ways. It resists the effects of insulin associated with fat deposition, and “forces” the body to switch to fat instead of glucose or carbohydrates in search of energy. GR contributes to the conversion of the relatively inactive hormone T4 to a much more active form of TK. It also supports the activity of beta-adrenergic cell receptors that interact with sympathetic nervous system hormones such as adrenaline and norepinephrine. Hormones help release fatty acids from fat cells. These processes slow down with age, which explains why it is becoming easier to gain weight and harder to lose it. By normalizing sympathetic reactions, growth hormone helps older people burn fat the same way they do in youth.

The benefits of growth hormone therapy

People with GH deficiency have a fatal brain disease called Kreutzfeldt-Jakob disease. With the development of genetic engineering (obtaining GR by recombination of DNA from bacteria), the drug has become much more affordable and free of prions (deadly organisms). This helped scientists test another aspect of GR - its deficiency in adults. It was previously thought that a drop in GH levels is an inevitable consequence of the aging process, but studies like Daniel Rudman in 1990 proved that correcting GH deficiency can lead to rejuvenation of the body, as well as preventing atrophic skin changes that make people look older than they really are. This is due to the weakening of the sweat glands. Their vessels are also unusually narrow and weak, the same with the heart, kidneys and lungs. The activity of the kidneys is weakening due to a decrease in their size. Since the kidneys are involved in the production of red blood cells, it is not surprising that their mass, along with the mass of blood plasma, is significantly reduced. As you might expect, such negative aspects of lack of GR affect the physical abilities of people (they have reduced power and strength). The maximum oxygen consumption as a measure of aerobic power in them is reduced on average by 20-30%, cardiac activity is weakened. Weak sweat glands increase the risk of overheating of the body during exercise, so the performance of such people is reduced. One of the most obvious results of GH therapy is to improve the psychological state. Patients taking the hormone become positive, while before treatment they quickly got tired and felt a lack of energy, their quality of life was low, which caused concern. Almost all signs of growth hormone deficiency receded with the start of its intake.

Subcutaneous fat

thawed, muscle mass grew, indicators of cardiovascular activity returned to normal. The skin thickened, hair began to grow. Atrophied internal organs, such as the heart and kidneys, returned to their normal size and normal functioning. Restrictions on physical activity disappeared, being replaced by a pronounced sensation of a surge of energy. If we take into account all these changes, it is not surprising that some began to call growth hormone the fountain of youth, since in many respects he "moved the clock" back. Despite the euphoria, the question still remained: how safe is it?

GH side effects

Most of the observed side effects of taking GH are dose related. Too much - and carpal tunnel syndrome, water retention, problems with glucose and joint pain occur. The goal of optimal therapy for GH is to replace what the body used to naturally synthesize and release. A little more - and there are problems. Dose reduction usually solves this problem. Growth hormone has been linked to the onset of diabetes, as this disease is often found in people with chronic acromegaly. GH counteracts the activity of insulin in the body (this is one of the reasons why athletes take insulin with GH) and can lead to hyperglycemia - an increase in blood glucose levels. Most scientists who have tested such aspects of the action of GR tend to think that only people who are genetically predisposed to diabetes have a chance of getting sick, and the development of this disease is almost never associated with the use of GR. Normal levels of growth hormone reduce the likelihood of diabetes, as it lowers insulin resistance by reducing body fat in the abdominal region - One of the forgotten aspects of the debate about

the connection of these hormones with cancer is the fact that when the levels of IGF-1 rise, an equivalent increase in the blood of protein-3 binding it, which deactivates the hormone, is observed. Only free forms of IGF-1 have any biological activity. The question of the influence of growth hormone on life expectancy is also open. We know, as noted above, that a lack of GR leads to early mortality, but it is not known whether life extends its optimal level. On the other hand, an excess of GH also leads to early death. The latter has been demonstrated in animal experiments. During one of them, it was recorded that mice lacking certain pituitary hormones, including GR, survived their counterparts who did not experience a deficiency of these hormones. The paradoxical effect is believed to have occurred due to a decrease in the total body temperature of rodents along with a slowdown in oxidative reactions. Another experiment showed that mice brought to the complete absence of cellular GR receptors lived a year longer than their normal relatives. It does not sound very impressive until we remember that the life expectancy of such mice is only two years. Genetically modified mice were smaller, had weaker bones, and were not as fertile as normal animals. In addition, they had lower levels of insulin, which, scientists suggest, could cause longevity. In another rodent experiment, no adverse effects of GH on life expectancy were noted. Ten-year follow-up of ten patients treated with growth hormone therapy revealed only positive changes, such as improved body composition and a reduced risk of cardiovascular disease. Another study involved 33 adults who took GH for seven years. There was no

adversely affect glucose tolerance or insulin levels. What we now know about growth hormone is that adults with its deficiency are characterized by a low quality of life, both from a physical and psychological point of view. There was also concern about the association between GR and cancer. Although some experiments have revealed a relationship between the intake of GR and the increased incidence of leukemia. More thorough studies of 32,000 children in Japan, where this relationship was first discovered, showed its absence, if there were no other risk factors. The growth hormone metabolism product, IGF-1, has recently been linked to certain cancers that affect the breast and prostate. But it is not known whether elevated levels of IGF-1 in these cases were a sign or culprit of cancer. If IGF-1 had contributed to the onset of the disease, then among acromegalics releasing significant amounts of GR and IGF-1, such forms of cancer would have been much more common, but this does not happen. On the contrary, a study of more than 1000 acromegalics has shown that the incidence of such forms of cancer among them is lower than among ordinary people. The best option is to maintain normal levels of growth hormone in the body.

LEARN TO POWER YOURSELF

So, you set yourself del to become taller. First, the first thing you should do is take a sheet of paper and write a commitment to yourself, in which indicate how many centimeters you swear to grow in a year. This must be done necessarily, because the effectiveness of classes aimed at increasing growth, largely depends on our mood on them, on the mental state, on the ability to combine them with the process of self-regulation. Now many people already know that not only long-term athletes can help achieve record results.

training. To cross the limit of their current capabilities, they need faith in their own strength. Their volitional purposefulness, desire, expressed in specifically directed thoughts and images, enhances the activity of the “interested” centers of the cerebral cortex and creates significantly greater effectiveness in achieving the goal. "Learn to rule yourself" - wrote A.S. Pushkin. To a person who has set himself the goal of becoming taller, this advice is simply necessary. Now we will list what needs to be done for this, we will draw up a plan of our actions. But, as you know, sometimes life and plans diverge. We wrote a commitment and calmed down - everything will be fine. Experience has shown that not all points of the plan can be implemented. There may be reasons beyond our control. And the most important thing at the same time is not to engage in “self-flagellation,” it can spoil the nervous system more than anything else. The shadow of doubt cannot be allowed - it “kills”. We must believe in ourselves, be firmly convinced of the availability of reserve opportunities, and boldly go to overcome the previously inaccessible "ceilings". And the more specific and brighter the images of the desired, created mentally, the more effective the effect in achieving the goal. There are several easy ways to tune in to our goal. For example, like this. Late evening. You are in a light nap. It is at this moment that the brain is especially sensitive to external stimuli. Ponder slowly, in detail about tomorrow, about that. what needs to be done, at what time, and about the need for classes to increase growth. Creative thinking enhances the effect of suggestion. But one does not need to force oneself, to give “tough” orders, such as “by all means ...”, “at any cost ...”, etc., everything needs to be done calmly. Morning. The alarm rings. Take your time to get up. Sweet nap doesn't let you out of your arms yet

Take advantage this - your brain at this time is extremely sensitive to incoming information, especially since you already prepared it in the evening for the fact that this information needs to be acquired. Stretch several times with your whole body, trying to stretch harder. Speak to yourself (this time in the form of self-order) the plan of the day, all that you have outlined, which you will definitely do today. Imagine yourself in appropriate situations when doing physical exercises. A suggestion made in the so-called subsidence state has tremendous power. You will be surprised to notice that you are somehow controlled by someone invisible. Walking along the street, you will have, and every day more and more, the desire to touch with your head the branches of trees that meet on your way. You involuntarily begin to compare yourself in growth with various people and objects. You will want to jump high, get some object that is higher than your height, hang on the bar, periodically stretch your whole body. If you find it difficult to perform exercises to correct posture, or any other exercises, do not despair. Program them, suggesting that these exercises should be performed by you daily, several times during the day. Inspire yourself that the most urgent thing on the weekend is to go to the pool or play basketball, volleyball, and that all this will bring you benefit and great joy. In short, you have to play the role of a growing person. And any game always brings joy. Do you think this is funny? And you probably think that you will not succeed. No need to lose heart. The main thing is to concentrate all your forces, both spiritual and physical, in order to achieve your goal. And now we will talk about what methods can influence the process of self-regulation.

Ideomotor training

It is known that athletes mentally repeat it before performing a particular exercise. Setting themselves up in this way, they use ideomotor training - the mental reproduction of movements. There is a direct connection between thought and movement. The very thought of motion causes this movement. Moreover, people achieve this unconsciously - ideomotor.



Photo 1. A group engaged in the methodology of R. F. Akhmetov

Scientists explain this fact by the fact that, under the influence of the power of imagination, brain cells, whose activity is associated with the experienced motor performance, are excited. The excitation is transmitted through the nerve pathways to the muscles, as well as to all organs and systems serving this motor action. This indicates the enormous possibilities of applying ideomotorism in various areas of human

activities, including those in physical exercises aimed at increasing growth. Therefore, everyone who has decided to increase their height needs to learn how to reproduce them mentally as accurately and vividly as possible when doing physical exercises. At the same time, clearly presenting the sensations that come from the musculo-ligamentous apparatus, similar to those that arise during the actual execution of the movement. In the absence of these sensations, you can limit yourself to visual representation. In this case, you do not need to look at yourself as if from the outside. Introducing the movement, you need to feel like a performer of it. In ideomotor training, it is advisable to take the pose that is characteristic of the position of the body during the actual execution of this exercise or close to this position. In this case, the brain receives much more impulses from muscles and joints, which helps to create a clearer image of the necessary action. That is why it is best to mentally imagine an increase in body length when lying down (photo 2). If you have firmly mastered the ideomotor reproduction of movement, then at the time of its mental fulfillment clear musculoskeletal sensations appear and even the desire to do it realistically. At the same time, even involuntary movements are noticeable, as if someone is leading “by the hand”. Do not resist this. Obey the orders of the brain, because it is he who is currently commanding your body. Moreover, there was a strong connection between him and the muscles, which is just what is needed. The best option for mastering motor activity is a combination of ideomotor training i.e. with real attempts to fulfill it. Try to feel and remember the characteristic muscular-11 and igital sensations during the execution of these elements and reproduce them in subsequent sessions



Photo 2. Mentally imagine an increase in body length, best when lying

ideomotor training. This will greatly enhance the effect of the latter, which means it will help to quickly and efficiently master the necessary motor actions. This is explained by the fact that there is a more operational attunement of the activity of a number of nerve centers,

those involved in the organization and execution of the motor act. Each repeated excitation of this group of centers both during ideomotor reproduction of movement and during its actual execution reinforces this motor act and strengthens the relationship between the brain and the executive apparatus. This is the programming, training, and tuning role of ideomotorism in mastering motor action. Mastering the skills of ideomotor training to a large extent helps autogenous training.

Autogenous training

The essence of autogenic training is that a person, relaxing with the help of auto-suggestion, the tense muscles of his body, can come into a state of relaxation or autogenous immersion.

Athletes know when the muscles are deeply relaxed, favorable conditions are created for recovery after any type of fatigue, whether it is physical or mental fatigue. In addition, by relaxing skeletal muscle through auto-training, we create the prerequisites for improving intermuscular coordination, the formation of such a structure of muscle fibers that does not interfere with bone growth. Many of you watched athletes involved in gymnastics, and paid attention to the fact that all of them, as a rule, are small-sized IL, with well-developed relief muscles. The muscles of the gymnast are easy to distinguish from the muscles of athletes - and basketball players or other athletes. It is this muscle structure that prevents them from growing. What is there before? And the essence of the matter lies in the fact that all the training and training of gymnasts is aimed at developing the strength that they need to perform complex chemical elements, and this, in turn, shortens muscles and “slows down” growth. Using the method of relaxation, stretching and other means, it is possible to achieve an effective change in the structure of muscles, which will beneficially affect the increase in growth. It should be noted that with all the attractiveness and ease of methods of auto-training, relaxation, to master

this type training is not easy. It is important to choose for yourself the option of auto-training that can be used most effectively, depending on what is your profession, type of occupation, health status, level of sports training. And it's not an easy task to learn how to arbitrarily relax muscles by giving mental commands. To do this, in a prone position, sequentially strain the various muscles, and then relax them. After tension, muscle relaxation is felt much better and causes a distinct sensation. Usually these sensations are perceived as a pleasant heaviness and warmth. Now let's start an autogenic training. It is better to deal with it, being in the initial position lying on your back or in the so-called "coachman" position, sitting on a chair, straightening your back, relaxing the skeletal muscles. This pose is reminiscent of the pose of a coachman sitting on an irradiation (hence her name) or a person who is napping while sitting in a carriage. This exercise should be performed in a sitting position on the edge of the chair, so that the legs are bent and spread apart for half a step, hands (with interlocked fingers) hanging between the legs, the body and head tilted forward. Being in this position, you should close your eyes, breathe shallow diaphragm (stomach) and feel the relaxation of muscles along the spine. This pose contributes to the feeling of "weightlessness" (lightness) of the body. Remaining in this half-awkward position should be pleasant. End the session after the words verbally auto-suggestion. Repeat each phrase 3-6 times: I rested, I am peaceful. " "I believe in the strength of my body." To feel the change in muscle tension with their relaxation, I recommend the following exercises:

1. Sitting on the edge of the chair, raise a half-bent leg and feel the "sluggish" state of its muscles.
2. Sitting on the edge of the chair, put your feet on your heels. Focus on the feet. Take a smooth breath. At the height of the inspiration, bend your toes, feel the tension of the

muscles. At the exit, relax your toes, repeating mentally the formula: "Toes are relaxed."
Repeat 2-3 times.

3. The starting position is the same. The calf muscle tension. When you inhale, put your feet on tiptoe, resting your fingers on the floor, mentally feel how the lower leg lengthens, on the exhale lower it to the floor and completely relax the calf muscles.
Repeat again.

4. The starting position is the same. Hip muscle tension. Do not inhale stretch your legs forward, repeating the formula: "I feel the tension of the hips, I feel how they are lengthening." As you exhale, lower your legs and relax them. Repeat the exercise again.

5. The starting position is the same. Tension of the abdominal muscles. On inspiration, I draw in my stomach, feeling tension, on exhalation I relax. Repeat 2-3 times.

6. The starting position is the same. Breast muscle tension. When you inhale, raise your arms upward, sagging like a body-length lengthens, on the exhale lower, relax the pectoral muscles. Repeat again.

7. Tension of the back muscles. The starting position is the same. As I inhale, I bend my back, feeling tension, repeating the formula: "I feel how the body is lengthening." On the inhale, straighten and relax the muscles of the back and lower back. Repeat 2 times.

8. Tension of the muscles of the neck. The starting position is that. On inspiration, turn your head to the right, on exhalation, return to its original position. Repeat the same, but the other way. Perform rotational movements of the head, sensing the pressure on the back of the head, then completely relax the back of the head and neck muscles.

9. Tension of the muscles of the face. The starting position is the same. As you inhale, frown, close your eyes, close your jaw. On the exhale

face relax, feel complete relaxation of the muscles of the face. The tension of various muscle groups on inspiration during the performance of all the above exercises is not an end in itself, it serves only to make it easier to subjectively feel a sense of muscle relaxation against its background. Therefore, as soon as the feeling of relaxation in one or another part of the body becomes sufficiently pronounced, you can refuse the preliminary tension of the muscles of this area.

Relaxation gymnastics

To achieve your goal of growing up, regulating internal systems and restoring balance, relaxation gymnastics will help you. After practicing relaxation gymnastics, an adequate attitude to the surrounding reality and to oneself appears, self-confidence, self-responsibility are increased. You can do relaxation gymnastics at any time convenient for you, provided that the stomach is not filled with food, i.e. 1-2 hours after a light meal or 2-3 hours after a hearty meal. If you have drunk water, tea or juice, start practicing in half an hour. In the room where the lesson is held, there should be a constant flow of fresh air, but not a draft, preferably silence, so as not to interfere with concentration. So, warm up.

1. Standing, feet parallel, slightly apart, arms down. Connect the hands, clutching more fingers (palms open), and while inhaling slowly raise them slowly up, then with an exhalation bend in the lower back (head between the hands), reach the floor with your palms and, without fixing the pose, inhale you to straighten, lower your hands - exhale. All warm-up exercises are performed once, slowly, smoothly moving from one to another. The main thing - do not strain!

2. Sit with outstretched legs. Head and back are on the same line. With both hands, grab

the left knee and pull toward you, the foot slides on the floor. As close as possible to the heel to the body, exhale to return the leg to its original position. The same, but with the right foot.

3. Bend the left leg, with the right hand grab it by the heel and place the foot on the thigh. With your left hand, press the knee of the bent leg several times, developing the femoral joint. We return the leg to its original position. Same with the other foot. The breath is arbitrary.

4. We take the bent left leg by the heel with the right hand, by the knee with the left hand and pull it to the groin. Reaching the groin, pull it to the stomach, then to the chest. The same, but with the right foot. Breathing is free.

5. Having bent the left note in the knee, we put it on the right thigh, put our hands together “in the lock”, raise them above your head and bend in the lower back, trying to get your socks off of your legs, touch your knees with your head. Be sure to try to grab your feet or lower legs with your fingers. Breathe out as you exhale, open your hands and lower through the sides. Repeat the same, but with the right foot.

Mastering Relaxation Poses

The first posture for relaxation is on the back. It's convenient to lie down with your legs slightly spread, your fingers outward. Hands slightly bent at the elbows are retracted from the body, palms up or down, as convenient. The head is inclined to the side or touches the nape of the floor. Eyes are closed. Shallow breathing, diaphragmatic (belly). Say in your mind the formula: “My hands are comfortable and pleasant.

My feet are comfortable and pleasant. Mr. Tin lies comfortably. The whole torso is comfortable and pleasant. ” Then, using the auto-training method, relax the face, limbs, and the whole body. Do not think about anything, watch your breath. The relaxation posture must be mastered for a long time, persistently, bringing to perfection. It is known that any organ of your body, including muscles, has a certain inertia and for a long time still maintain tension after exercise, even after water procedures. Such muscles and organs remain prepared for more intensive work than is required in this case. Relieving stress saves forces, brings them in line with real need. Another pose of relaxation is on the stomach. One hand is laid up behind the head, the other along the body, below. You can put both hands up or down, as convenient. Legs slightly apart, socks together, heels apart. After each exercise, move to the most comfortable posture of relaxation. When doing exercises, think only about movements, your breathing, the sensation of an increase in body length. For better concentration, do the whole complex with your eyes closed. But this is already when the technique of performing poses and their sequence will be well mastered. The time of inspiration and expiration is the same in duration. Of course, not everything will work out the first time. It is necessary to remember firmly that any exercise should bring joy, after each pose a short rest is necessary. Do not rush to do all the exercises at once. As an experienced musician feels the keys of a piano, so you should feel your body. Perform each exercise only as much as it turns out.

It is necessary to enter the pose slowly, concentrating attention on its implementation. This not only enhances the body's defenses, but also fosters concentration, will, and the ability to observe and control one's well-being. In relaxation gymnastics, a continuous transition from one pose to another is important. For a more accurate description of an individual exercise, the term "posture cycle" has been introduced — a set of movements and technical conditions that separate the similar phases of the two subsequent exercises. Each cycle includes 6 successive stages:

1. Rest before entering the pose.
2. Mentally adjusting to pose.
3. Entering the pose.
4. Fixation of the posture.
5. Exit from the pose.
6. Relaxation after exiting the pose. The posture fixation time in the first week of classes should not exceed 7 seconds. Then it gradually increases.

Basic poses

1. Lie face down with your forehead touching the floor. Put your palms on the floor, each under the corresponding shoulder, lifting your elbows up and pressing them to the body. Legs together, socks pulled, eyes closed. Entrance to the pose: open your eyes, tear your chin off the floor, slowly raise your head, then chest, arching your back so that the lower body from the navel to your toes remains on the floor. Look forward and up for as long as possible. Do not lean on your hands. Focus on bending the spine. We fix the pose, then slowly lower the body first, then head to the floor, close our eyes and relax. During the rise, inhale, while holding the posture, breathing is free, lower on the exhale.

After completing the pose, relax. Raise your hands up and roll over on your back. Relax and get ready for the next exercise.

2. Lying on your back, arms along the torso. Take a breath Holding your breath, slowly raise your tense legs, resting your palms on the floor. When the legs have reached an almost vertical position, raise the pelvis and lower back. Then, exhaling slowly, lower your legs behind your head and touch the floor with your big toes. Fix the posture in free abdominal breathing.



Slowly lower your legs to the starting position (photo 3).

Photo 3. Perform relaxation poses

3. Lie face down, resting his forehead on the floor. Bend your knees and grasp your ankles with your hands. Bend your back so that the body weight falls on the stomach. The hips and chest are raised. Do not throw your head back. Remain in a pose for a few seconds, then relax and return to starting position. As you master the exercises press your knees and bend more and more. During the rise - inhale, in a pose breathe freely, while

exhaling - return to its original position.

4. Lie on your back, raise both legs, bend at the knees and group, holding hands on the feet or ankles. Lips touch knees. Take a breath Keep your posture until you can breathe. Then exhale slowly, returning to its original position. Perform a pose twice.

5. Lie on your back, hands along the torso, palms down. Inhaling, slowly raise your legs up. Then hold your breath, palm up your lower back and raise your whole body so that your chin is pressed to your chest. Raise your forearms at the same time to maintain your back. When exiting the pose, carefully place the legs behind the head (a little), lifting the weight of the body from

6. Sit on the floor, legs extended. Raise your hands with your palms forward with your woven thumbs. Take a deep breath and as you exhale slowly lean forward. Touch your knees with your forehead, try to grab your big toes with your hands. During the fixation of the posture, breathing is arbitrary. Then, on exhalation, return to the starting position.

7. Lie on your back, legs stretched out, arms raised behind his head. Lift the pelvis, resting on the heels, shoulder blades and back of the head. Do not strain the spine, but stretch it. Repeat twice. At the entrance to the pose - inhale, exit on the exhale. The complex completes the relaxation on the back. Fully relieve tension from the whole body, achieving a feeling of lightness, a pleasant, joyful feeling. After resting in relaxation, stretch yourself, saying the formula: "I am energized, I feel cheerful and efficient. I am growing. " Stretch and get up. Do not count on very quick success.

Understay! you need to eat regularly, gradually increasing the number and • falsity of exercises, the time of fixing poses. And constantly, watch your well-being.

MAGIC POWER OF PHYSICAL EXERCISES

Nowadays, it is becoming increasingly difficult for people to find a prescription against many diseases if they are new to the amazing and many-sided effects of various physical exercises on the human body. We will again and again learn about what amazing results can sometimes be achieved with the help of nature, by the nature of these funds, where the surgeon's scalpel or patented drugs are powerless. The role of physical exercises is especially important when it is not a patient, but a healthy person, who needs only to strengthen and maintain the necessary level of health and some “cosmetic” restructuring - correcting posture, increasing height, normalizing weight, building muscles, etc. .”In recent years, it has been established that moderate-intensity physical activity lasting 1.5-2 hours can cause a more than threefold (!) Increase in the level of somatotropin in the blood. But that is not all. Persons who perform physical exercises during the day, there is a repeated increase in levels of growth hormone and at night. This phenomenon is somewhat similar to the introduction of growth hormone to increase growth in the treatment of dwarfism. And if growth hormone is introduced from the outside or, in the case of physical exercises, its content in the blood increases due to the secretion by the endocrine glands, one result is a higher level of growth hormone in the blood - the growth is more intense. Is it any wonder then that regularly engaged in physical education children and young people grow faster. To verify this, you can turn to special studies conducted by the Academy of Pedagogical Sciences, which compare the growth rate of children depending on the level of physical activity. And you can do much easier ... There is an opinion that the largest and tallest guys are selected in sports sections. And this opinion seems to be

confirmed look at any class in a regular school, and you will see that the "rated sportsmen" look, as a rule, more solid than other students. It turns out that there is an injustice in relation to those boys and girls who did not come out tall. Do not rush to conclusions. With a more detailed acquaintance, it turns out that there is no injustice, and in the problem of "growth - occupations in the section", everything is exactly the opposite. In the section, everyone is invited, whom the doctor will allow, but then those who practice regularly regularly begin to outstrip in growth those who are limited only by physical education lessons. So after 2-3 years the impression is created that the tallest and the most broad-shouldered are selected in the section. Speaking of shoulders. If the direct connection between physical activity and an increase in someone's body length may be surprising, then there is no doubt that athletes are more broad shoulders than people who are far from physical education. Meanwhile, growth in height and growth in width are two inextricable parts of a single process, due to physical exertion, and therefore, if a person becomes wider in the shoulders, then ... In fact, during training, blood circulation, breathing, neurohumoral regulation improves, the metabolism becomes more intense, the level of growth hormones rises. As a result, there is stimulation of the growth of muscles, blood vessels, ligaments, bones, in a word, harmonious growth of the whole organism, including, of course, up. To explain the growth effects of physical activity, let us draw the attention of readers to one more of their features. Many exercises, in particular in the complex we offer, are aimed at stretching (sipping, jumping, sleeping with rubber towels pulling in opposite directions). Is it a coincidence? Of course not. In order to make the physiological meaning of exercises quieter, let us turn to the works of Professor G.A. Ilizarova.

Exactly

his operations for fractures of long tubular bones are the most obvious model of the issue of interest to us. In fact, during operations, the professor stretches the bone fragments, and introduces the cells of young bone tissue into the lumen between them, which then, ossified, fill the defect and build up the bone. Thus, in particular, it is possible to help patients who have one leg shorter than the other. In the same way, it is possible, in principle, to lengthen, for example, the bones of both legs, and therefore the height of a person. Something similar to the described model, only non-surgical and much slower, you can lengthen the legs without surgery. This occurs with the systematic performance of tensile exercises. Regular “stretching” of long tubular bones in the growth zones facilitates filling them with proliferating bone cells and promotes elongation. This stretching should be done with the help of weights. You can buy them at sporting goods stores or make them yourself. It is not necessary to hang more than 5-7 kg per leg. In addition, before doing this, you should perform all kinds of exercises for the legs, so that the bones are already prepared for stretching. This is jumping up, jumping rope, swing legs and others. During such exercises, small microcracks form in the bones. The essence of these microcracks is that they are overgrown with new bone tissue. Simply put, with an operation you immediately make a large crack of 5-7 cm, and with the help of microcracks - tenths if not hundredths of a millimeter. Therefore, if you choose a non-surgical method, please be patient. Do not expect to grow by 2-3 cm in the first days. But when you see the result, you will understand that everything was done for good reason. The possibilities of man are truly inexhaustible. It can become perfect both spiritually and physically. This can be seen on the example of Indian yogis. Harmonies of unity of soul and body of yoga are achieved once

personal methods: alternating well-designed and worked out body positions (posture), complete muscle relaxation, various techniques and breathing exercises. The ability to completely relax allowed them to achieve such a concentration of consciousness that they gained the ability to control processes in the body, which we used to consider to be involuntary, not subject to our will. Among the physical exercises aimed at increasing growth, a special place is occupied by exercises to stretch the body (stretch marks). Their essence is that when stretching different parts and the whole body in the appropriate directions, we achieve alternating tension and relaxation in the muscles. Moreover, changing the strength and direction of the load, using various openings of stretch marks and combining them in certain combinations, we can use many muscle groups. Stretch marks are based on natural movement. Everyone knows how you want to stretch your whole body, waking up from a dream. Everyone happened to watch the animals when they, waking up, stretch from head to tip of the tail - stretch, straighten the legs with tension, shake, i.e. Awaken, straighten, bring into active state every muscle of his body. A tired person also, especially after a long sedentary work, wanting to overcome fatigue, stretches with effort, tries to straighten up, stretch himself stronger. In fact, during stretching exercises, blood circulation, respiration, neurohumoral regulation improves, metabolism becomes more intense, and the level of growth hormones increases. As a result, there is stimulation of the growth of blood vessels, ligaments, bones, in a word, the harmonious growth of the whole organism, including, of course, up. Stretch marks contribute to the acquisition of deep relaxation, which has a beneficial effect on emotional

the realm. Training emotional stability will provide an opportunity not only to get rid of excessive nervous and mental stress, unnecessary experiences, but also contributes to a kind of gymnastics of the nerve centers. When stretching the skin, muscles, tendons, joint bags, the corresponding mechanoreceptors are excited, and these excitations in the form of centripetal impulses reach the cerebral cortex and cause a response in the body. Thus, various methods of stretch marks reflexively cause a reaction from the nervous system, improve trophic processes in the skin, muscles, and tendon-ligamentous apparatus. At the same time, affecting the somatic and mental spheres of a person, we achieve increased fitness of the whole organism, facilitate filling of long tubular bones in the growth zones with multiplying bone cells, and therefore contribute to the elongation of the body. Starting to stretch marks, it is necessary to teach a person to relax. If relaxation does not work out, you need to find the reason that interferes with relaxation - an over-stressed, pinched muscle or group of muscles, and with the help of auto-training or massage to relax the muscles. It is also necessary to relieve facial muscle tension. The most favorable position for relaxation is lying on your back or stomach, best on the floor. Stretch marks can also be performed in warm water (especially effective at a water temperature of at least 28 °), in a sauna.

Guidelines for doing stretching exercises

Body stretching exercises can be done individually, in pairs or in a group - in any case, they will be useful.

When performing individual stretch marks, a person himself makes certain movements to stretch one or another part of the body. Paired exercises or group exercises expand the possibilities of influencing the body of those involved, increase the intensity of classes, and allow you to work on the development of agility, flexibility, and coordination of movements. These exercises are very emotional and greatly increase interest in the classes. When describing pair exercises, it is stipulated that the partner performing the main actions is the first, and his partner is the second. During stretching, there should be no tension in the muscles, but only a feeling of soft stretching. Stretching should be unsharp, without unnecessary effort. It is desirable to carry out the tension along the axis of the muscle fiber with a gradual stretching, without causing anxiety and discomfort. Some exercises give brief guidelines that reveal the most significant aspects: the shape and nature of the movements, pace and breathing, the sequence of study and options for implementation. This book gives exercises that have been used for many years of work to increase growth and in which you can make changes and refinements in accordance with the characteristics of the contingent of students. In addition to organized classes, I recommend stretching in any free time. The magnitude of the stress forces:

1. The minimum force is 5-10 kg.
2. The average is 10-15 kg.
3. The maximum is 15-25 kg.

The effectiveness of the stretch depends on the duration, regularity and awareness of its use, despite the fact that the result is visible immediately after execution.

Remember some simple rules: 1. In individual exercises, stretch marks are mainly used to develop flexibility. It is advisable to apply: swing movements with a large amplitude and its gradual increase; repeated springy movements performed "at the limit"; keeping the links of the body in the final position; self-grips, additional support and projectile, weights. The benefits of these exercises are greater, the longer and more often they are used. 2. When performing exercises in pairs, it is necessary to select partners approximately equal in height, body weight and strength. 3. You should gradually approach the development of new tasks - from simple to complex, from a smaller load to a larger one. Perform separate, more complex exercises after a good workout. 4. Do not stretch at a fast pace. 5. Each stretch should be carried out with a clear and specific purpose. To do this, you must first analyze the stretch. It is advisable to immediately warn against possible errors, indicating the most important points. 6. It is advisable to alternate the effects of stretch marks on the muscles of antagonists and synergists. 7. When performing exercises on the gymnastic wall, you must always determine exactly which rail to stand on, which rail (or at what height) to hold on to. Before performing exercises in pairs and groups, you should first familiarize yourself with the following methods of grasping with your hands: grasping with your fingers - mutual grip with bent fingers; grip "into the castle" fingers are bound; grasping the thumbs with the same hands; deep grip - double grip on the wrist joints with the same hands; direct (usual) grip - palms of the same hands to each other, wrist joints between the index and secondary with your fingers facial grip - hands transverse with palms to each other with opposite hands; shoulder grip standing facing each other, the lower one holds the upper by the shoulders, and the upper lower by the elbows.

Exercises

1. I.P. - free hanging back to the gymnastic wall. Duration 20-30 s (photo 4).



Photo 4. I.P. - free hanging back to the gymnastic wall. Duration 20-30 s Option: the same, but with a burden of 5-10 kg.

2. I.P. - the first in free hanging with his back to the gymnastic wall, the second crouching and taking the first by both legs at the ankle joints, pulls the first downward with springy movements. Duration - 20-30 s (photo 5).

3. I.P. - free hanging upside down, arms down, both legs at the ankle joints secured with special straps. Duration - 20-30 s (photo 6). Option: the same, but with a weight of 5-10 kg



Photo b. I.P. - free hanging upside down, arms down, both legs at the ankle joints secured with special straps

4. I.P. - free hanging upside down, hands down. Both legs at the ankle joints are fixed with special straps. The second, taking the first by the hands, pulls the partner down with springy movements.
5. I.P. - standing sideways to the gymnastic wall, holding on to the rail at the level of the belt. Make a "twine" right (left) leg in front. Be in this position for 7-10 s.
6. I.I. - stand legs apart. With sliding movements, spread your legs, stand in the "transverse twine" position. To be in this position for 7-10 s (photo 7).



Photo 7. I.P. - stand legs apart. With sliding movements, part the legs to stand in the "transverse twine" position

7. I.P. - free hanging back to the gymnastic wall. Pendulum swings left and right.
8. I.P. - lunge right (left), hands on the belt. Spring swinging (squats). Exercises are performed repeatedly until complete twine.

9. I.P. - legs apart. Tilt back until hands touch heels.

10. I.P. - standing with your back to the gymnastic wall, the right (left) leg is bent at the knee joint and fixed to the rail, the left (right) at a distance of 50 cm from the wall. Tense bending of the body.

11. I.P. - lying on your back, legs are straight, hands along the body rest on the floor.

Raising the legs to touch the socks of the floor behind the head. Be in this position for 7-10 seconds. Then return to I.P.

12. I.P. - Standing sideways against the wall, grasp the rail with your hand. Free swinging leg - bringing forward the hips of the bent leg in the knee joint, followed by backward sweeping of the leg. Exercise is performed with a maximum range of motion for each leg separately.

13. I.D. - hanging on the gymnastic wall. Raising legs to touch the staff behind the head with socks. Exercise is performed at a slow pace.

14. I.P. - lying on his stomach on a gymnastic horse, legs fixed, arms up. Raising the arms and torso to fully bend in the lower back. Exercise is performed at a slow pace.

15. I.P. - the second one, standing in a semi-squat on a 2-3 rail from the bottom right up against the wall, holding the rail with arms bent at the level of the shoulders, the first in free hanging with his back to the back of his partner. The second, unbending arms and legs, raises the partner, increasing the deflection in the chest part of the body (photo 8).

16. I.P. - the first one sitting right back against the wall, one leg bent, hands holding the rail over his head, the second in a lunge facing the partner, holding his hands on his straight leg at the ankle joint. The first, energetically pushing his back, bends into the bridge, the second pulls the partner's leg forward - up from the wall, increasing the

deflection.



Photo 8. I.P. - the second in a semi-squat on a 2–3 rail from the bottom, directly facing the wall, holding with bent hands I will stab at shoulder level, the first in free hanging with my back to the back of my partner. The second unbending arms and legs, raises the partner, increasing the deflection in the chest of the body

17. I.P. - the first, in the hang facing the wall on the 3-5th rail from above, the second, standing behind in the lunge, taking the first by both legs at the ankle joints. The second, straightening up, raises the straight legs of the first back, increasing the deflection in the lumbar and chest parts of the body. Option: the same, but raising one leg.

18. I.P. - the second, lying on his back with his head against the wall, holding his hands for 2-3 rails from below, legs bent in front; the first, lying with his back on the partner's feet with his head to the wall, holding his hands on the rail. The second, straightening the legs forward, with springy movements of the legs enhances its deflection in the lumbar region and the thoracic spine (photo 9).

19. I.P. - the first, lying on his stomach with his head to the wall at a distance of arms extended upward, holding 2-3 rails from below, the second in a squat from the side of the partner's legs, taking him by both legs at the ankle joints. The second, getting up, raises the straight legs of the first and takes them back, increasing the deflection in the lumbar and chest parts of the body. Option: the same, but lifting one leg (left and right alternately).

20. I.P. - the second, with emphasis on the knees sideways to the wall at a distance of one step, the first with emphasis lying on the partner's hips on the back of the partner, clutching socks on the 3-4th rail from below, hands on the floor. Options: 1) the first leans back, hands on the belt (to the shoulders, behind the head, to the sides, up) and returns to I.P. ; 2) the same, but fixing the bent position of the body; 3) the same, with the body turning left and right (alternately); 4) circular movements of the body to the left and right.

21. I.P. - the first, lying on his stomach, legs straight, arms up. The second sits on the back of the first and holding the straight arms of the first, takes them to the back (photo 10). option: the same, but with twisting the body.



Photo 9. I.P. - the second, lying on his back with his head against the wall, holding his hands on a 2-3 rail from below, legs bent in front; the first, lying with his back on the partner's feet with his head to the wall, holding his hands on the rail. The second, straightening the legs forward, with springy movements of the legs enhances its deflection in the lumbar region and the thoracic spine

22. I.P. - the first, lying on his stomach, legs straight, arms up, second, sitting on the lower back of the first, leaning on

the ass, without bending its arms, pulls the first knees on itself (photo 11). Option: the same, but with twisting the body.



Photo 10. I.P. - the first, lying on his stomach, legs straight, arms up. The second sits on the back of the first and holding the straight arms of the first, takes them back

23. I.P. - the first, lying on the left (right) side, the right (left) hand up, the left (right) - along the body, the right (left) leg is bent, the left (right) - straight. The second kneels from the back, puts palms on the shoulder and hip joints, while simultaneously moving the shoulder girdle away from you, and the lumbosacral region toward you, twists the spine and stretches the muscles. Duration of stretching - 6-7 s. Then repeat, but to the other side (photo 12).

24. I.P. - the second, lying on his back with his head to the wall at a distance of two steps from it, hands forward - up, the first in the gray face to the wall, legs apart, feet on the 3-4th rail from below, the body is tilted back, leaning with the neck

on the palm of a partner, hands on the belt. The first bends, resting on the feet and neck, and sits down again



Photo 11. I.P. - the first, lying on his stomach, legs straight, arms up, the second, sitting on the lower back of the first, leaning back without bending his arms, pulls the knees of the first on himself

25. I.P. - the first, standing with his back to the wall (slightly stepping away from it), leaning forward, holding his hands at the rail at the level of the pelvis, the second in gray with his back to the partner, legs bent, feet on the floor, arms up, grabbing the first by the neck. The first one straightens up, raising the partner, and again leans forward. Option: the same, but the second lies on his back with bent legs.

26. I.P. - the second is standing, legs apart facing the wall at a distance of a step. The first, sitting astride, clinging to the rail with his socks, leans back to the hang and with both hands grabs the ankle joint of the arched leg of the second. The second, slowly advancing the noiu to the wall, enhances the deflection in the chest of the first body

(photo 13).



Photo 12. I.P. - the first, lying on the left (right) side, the right (left) hand up, the left (right) - along the trunk, the right (left) leg is bent, the left (right) - straight. The second kneels, from the back, puts its palms on the shoulder and hip joints, while moving the shoulder girdle away from you, and the lumbosacral region twists the spine and stretches the muscles

27. I.P. - the second in the leg position apart facing the wall at a distance of a step. The first lying, bending astride the shoulders of the second with his back to the wall, clinging to the rail with his socks, resting his hands on the partner's back, the second supports the first by the legs.

Options: 1) the first, raising the body, leans back, hands on the belt (to the shoulders, to the sides, behind the head, up); 2) the same, but fixing the bent position of the body; 3) the same, but with a turn of the body left and right (alternately).



Photo 13. I.P. - the second is standing, legs apart facing the wall at a distance of a step. The first, sitting on horseback, clinging to the rail with his socks, leans back to the hang, and with both hands grabs the second leg's ankle joint. The second, slowly advancing: the foot to the wall, enhances the deflection in the chest of the body of the first

28. I.P. - the second, facing the wall at a step distance in the leg stance, apart with an inclination with the straight body forward, holding hands for 6-8 rail. The first is lying on top with your back (head to head) - grabbing your hands for the 8-9th rail, raises and lowers legs.

Options: 1) bend your legs forward - lower down; 2) bend the legs forward - straighten forward - lower the straight lines; 3) alternately moving with straight legs, then sequentially ("scissors"); 4) raise straight legs - lower, changing the amplitude of movement (until the toes touch the wall); 5) circles kicked left and right.

29. I.P. - the second lying on his back with his head to the wall at a distance of half a step, holding straight arms for 3-4 rails from below, legs forward, the first from the side of the partner's legs, lying with his back on his feet, grabbing hands for the 8-9th rail. The first raises and lowers legs alternately, both together.

30. I.P. - the second in emphasis on the knees sideways to the wall at a distance of a step, the first sitting on the partner's back facing the wall, clinging with socks on the 1-3 rail below, hands on the belt. Options: 1) the first leans back and returns to ip (arms to shoulders, behind the head, up); 2) the same, but with an additional forward bend; 3) the same, but with a turn of the body left and right; 4) tilts back, fixing the body at a different angle.

31. I.P. - the second in emphasis on the knees sideways to the wall at a distance of a step, the first, sitting on the partner's back facing the wall, catching with one foot on the 1-2 rail below, hands on the belt. Tilt back, lifting one leg forward (alternately).

32. I.P. - the second leg in the leg apart, facing the wall at a step distance, the first sitting astride the partner's shoulders, legs forward, clinging toes on the rail (at the

height of the second chest), hands on the belt. The second holds the partner's hands by the feet (or holds his hands on the rail at shoulder level).

Options: 1) the first leans back and returns to I.P. (arms to shoulders, behind the head, up); tilts at different angles; 2) the same, but with a turn of the body left and right.

33. I.P. - the first leads to the wall at a large stride distance, in the leg stand apart, with the body tilted forward, arms up to the sides, resting them in the staff, the second stands with its back to the wall between the hands of the first, with palms resting on the partner's shoulder blades. The first - springy inclinations forward (grip gradually narrow), the second by hand pressure enhances movement in the shoulder joints.

34. I.P. - the first to face the wall at a great stride in the knee rack, with the torso straight forward, arms up, hands on the rail, the second in the leg stand apart, from the back in the half-slope above the partner, resting palms on his shoulder blades. The first - springy bends forward, the second helps him.

35. I.P. - stand legs apart, back against back to each other, holding hands at the top. Springing movements of the hands back and forth (alternately). Options: 1) the same, but arms up - out; 2) the same, but arms to the sides; 3) the same, but arms to the sides - down; 4) the same, but the hands below.

36. I.P. - stand legs apart with their backs close to each other, arms to the sides down, holding hands. Circles hands back and forth.

37. I.P. - standing, legs apart (together) with their backs close to each other, arms up, holding hands. Partners alternately leaning forward, lift each other on their backs (photo 14).

38. I.P. - stand legs apart (legs together) with the lead to each other at a great stride

distance, forward with your palms resting on your partner's shoulders. Simultaneous inclinations, bending forward, pressing straight on the shoulders of the partner.



Photo 14. I.P. - standing, legs apart (together), backs close to each other, arms up, holding hands. Partners alternately leaning forward, lift each other on their backs

39. I.P. - the stand is facing each other at a step distance, the first one bending down in an inclination, holding the partner's belt with straight hands, the second in a half-inclination puts his palms on the shoulder blades of the first. The first one bends forward, the second by pressing hands from above enhances movement in the shoulder joints.

40. I.P. - the first in the leg position apart, bending his arms up, joining his fingers "into the lock", the second stands on the side at the level of the head of the first, supporting the partner's hands with one hand, and putting the palm of the other between the shoulder blades. The first one bends forward, the second by pressing a hand on the back enhances movement in the shoulder joints.

41. I.P. - the first leg in the leg apart (legs together), arms up, joining hands, the second

is standing behind him, washing with one hand the arms of the partner above, and the palm of the other, putting between the shoulder blades of the first. The second, pressing his hand on the back of the first, takes his hands back.

42. I.P. - a stand in the back of the head to each other, the first - arms up, the hands down, the second - behind, grasping the partner's hands with the usual grip (or grip with your fingers). The first is a lunge of the right (left) and springy swaying forward, while maintaining the vertical position of the body. The second holds the hands, increasing movement in the shoulder joints. Option: the same, but hands up - out.

43. I.P. - the first sits with his legs crossed, arms up, the second stands behind in a lunge, resting his knee on the partner's back and holding his hands in the wrist joints and pulls the hands of the first back with springy movements or fixing his hands in the final position. Option: the same, but the hands of the first up - out.

44. I.P. - the first lies on the stomach, arms up, the second stands on the back (lower back) of the first (photo 15). Options: 1) the second steps moves along the back (lower back) of the first; 2) in the same I.P. the second spreads its legs apart.

45. I.P. - a wide leg stand apart facing each other at a distance of two steps in an inclination forward, arms forward - up, connecting the hands and touching the floor with them. To bend, raising his head and raising his hands up - out, return to I.P.

46. I.P. - the first lies on his back, raising his legs forward - hands behind his head down, the second stands on the side of the feet of the first, facing him, holding his hands from below the ankle joints of the partner. The first one bends, resting on the shoulders and feet on the hands of a partner, then lies down. Option: the same, but keeping his legs apart, the second stands at the feet of the partner.

47. I.P. - the first is in a gray-haired position, hands up, grasping the neck of the second one, which is standing, with your legs apart behind your partner's back, facing him in a half-slope, bending, resting your hands on your knees (or holding them on your belt). The first one bends, taking the position of the vis, while lying down, and returns to I.P.



Photo 15. I.P. - the first, lies on the stomach, arms up, the second stands on the back (lower back) of the first

48. I.P. - the second leg in the leg apart, hands on the waist, ■ s, the first in front with his back to the partner, assumes the position of the hang while bent over, holding the second ■ neck. The first one bends, lifting i in front of the right leg, then falls into I.P. Same to them and their left foot.

Option: the same, but the second holds his hands behind his head, joining his fingers "into the lock", elbows forward, the first - in the suspension on the shoulders of the partner, grip on the outside.

49. I.P. - the first lying on his stomach, arms up, the second in focus on the knees from the legs of the first, resting his hands on the ankle joints of the partner. The first one leans back with the body turning to the left, moving the right hand to the side, the left - behind the head and returning to I.P. Same thing the other way.

50. I.P. - the first, lying on the partner's back across, resting his hands on the floor, the second kneeling in emphasis, the first bends, spreading his arms out to the sides and fixing the position by bending, then falls into I.P.

51. I.P. - the second lying on his back, legs bent forward, arms forward. The first one, standing on the side of the legs facing the partner, lies belly on the partner's feet, joining hands in the facial grip, the second straightens the legs forward, the first, raising the legs back, fixes the position by bending.

52. I.P. - grab your legs apart wider, facing each other, resting your feet on the partner's feet, arms forward, connecting them with a deep grip (or grip with your fingers).

Options: 1) alternating inclinations back (single or springy); 2) circular movements of the body.

53. I.P. - the leg stand apart facing each other at a large stride distance, tilted with a straight torso forward, arms to the sides - up, connecting your fingers "into the lock".

Turns the body to the right and left (single or springy), helping each other.

54. I.P. - the first, in the leg position apart, leaning forward with the torso straight, hands behind the head, joining fingers "into the lock", the second standing in front at a step

distance, holding the elbows of the partner with his hands. The first turns the body to the right and left, the second helps.

55. I.P. - the first, lying on his back, legs forward, hands behind his head, the second, standing at the feet of the first, facing him, holding hands bent forward by the legs of the partner from below at the ankle joints. The first one bends, tilting his head back and leaning it on the floor, then returns to I.P. Option: the same, but spreading his arms to the sides.

56. I.P. - lying on his back with his head to each other at a half-step distance, hands up - out (on the floor), connecting the hands. Options: 1) right legs, lift forward - lower them to the left until the floor touches, raise forward again - lower (attach); 2) simultaneously lift both legs forward - lower them to the right (in opposite directions with respect to each other), raise forward - lower them down.

57. I.P. - the first lying on his back in front of a standing partner, his head to him at a distance of outstretched arms, holding the ankle joints outside, the second - in the leg stance apart. Options: 1) alternately bending and unbending legs, circular movements of the feet in the lateral plane ("bicycle"); 2) circular movements of the feet in the lateral plane with two legs simultaneously forward or backward, changing the size of the circle.

58. I.P. - the first in the gray legs apart, hands on the belt (behind the head), the second - with emphasis on the heels in the legs of the partner facing him, resting his hands on top of the legs of the first at the ankle joints.

Options: 1) the first leans back with a turn of the trunk to the left (right) - returns to I.P. ; 2) the first leans back - to the right and returns to I.P. ; the same, but with a tilt back - to the left; 3) the same, but with thrilling tilts forward - to the right and forward - Mr. \evo;

4) circular movements of the body to the left and right. 59. I.P. - the first in gray with a half-inclination forward, ru- m forward, grasping the right (left) lower leg with tassels, the Jurassic resting on the knees from the legs of the first, • rest on the free left (right) leg of the partner at ankle the joint. The first leans back, holding on a straight leg, and returns to I.P. ; same, but changing his leg.

60. I.P. - the first is standing in front facing the second at a step distance, the right (left) leg is forward, putting the foot on the knee of the second, which in a rack on one knee grasps the partner's lower leg with his hands. The first leans back and straightens, changing the position of the hands (on the belt, sideways, behind the head, up). The tilt can be performed with a straight body and bending.

61. I.P. - stand facing each other at a large stride distance, the first - lifting the right (left) leg forward, the second - holding his feet with his hands. The first leans back and straightens, changing the position of the hands (on the belt, sideways, behind the head, up). Option: the same, but the second stands in front of the first side and holds it by the leg, by the shin and thigh.

62. I.P. - stand legs apart, back against back to each other, holding his elbows. Options: 1) the first leans forward, raising a partner, the second bends; 2) the first makes a tilt with a straight torso, the second bends the legs forward, then lowers them down, and the first straightens; 3) the same, but the second, lying on his back, raises straight legs.

63. I.P. - the first is the emphasis lying on the hips on the forearms, the second is standing on the knee on the side, putting one hand to the partner from above on the lower back, and the other holding the bottom of the thigh at the knee. The second raises the leg of the first and in springy movements increases the amplitude.

64. I.P. - the first lying on his stomach, bending his legs back, arms up, the second in a squat from the back from the side of the partner's legs, holding his ankle joints from below. The second gets up and, straightening the legs of the first, with springy movements back increases the deflection of the lumbar part of the body of the first.

65. I.P. - stand legs apart facing each other at a step distance, connecting the right (left) hands in the as usual grip. The first, bending, leans back with a turn of the body to the left (right), left (right) hand - to the side - down to touch the heel of the same foot; the second, leaning back, supports the partner.

66. I.P. - stand on the left (right) knee facing each other, straightening the right (left) leg forward and resting your foot on the partner's knee, hands forward, connecting them with a deep grip (or grip with your fingers). Alternating deep tilts back (before touching the floor with your head) with the support of a partner.

67. I.P. - the first is in a handstand, the second is in a lunge from the side of the partner's back, supporting him with both hands for the lower legs. The first one bends, the second, lowering the legs of the partner on itself, reinforces the deflection.

68. I.P. - the first in the leg stand apart, arms up, the second in the leg leg apart sideways from the back of the first. The first leans back "into the bridge", the second supports the partner with both hands under the back and helps to get up.

69. I.P. - the second in a rack on one knee. The first in front at a step one side to the partner in a rack on one leg, placing the other with his toe on the knee of the other. The second holds her foot. Tilts left and right, changing the position of the hands: on the belt, sideways, behind the head, up. Option: tilt to the opposite side from the partner, fixing a

straight torso.

70. I.P. - a wide leg stance apart close to S'PINA to each other, arms to the sides, joining hands. Torso turns alternately left and right (single and springy), helping each other.

71. I.P. - stand, legs apart back against back to each other, holding his elbows.

Alternating tilts left and right (single and springy), helping each other-

72. I.P. - gray hair, legs apart wider, close to the back of the fugue to a friend, arms to the sides, joining hands. Turns torso alternately left and right (single and springy), helping each other.

73. I.P. - the first leg in a leg apart with an inclination forward, the arms forward between the legs, the second behind in the gray legs apart, resting the feet on the feet of the partner, the arms forward, connecting them with the arms of the first in a usual grip (or grip with your fingers). The second - single or springy tilts back, helping the first to increase the tilt forward. The first, straightening, pulls the second forward. Option: the same, but partners keep their legs together and their arms outside.

74. I.P. - standing facing each other at a step, putting his hands on the shoulders of the partner. Swinging legs: forward - outward, sideways, backward. Movements can be performed with the same legs, right or left (in different directions), or opposite (in one direction), or alternately with a partner.

75. I.P. - the first is standing on the right (left) leg, the other is forward, the hands are on the belt, the second is standing sideways facing the partner, putting one hand on the shoulder (or behind the back), and the other, taking the first leg from the bottom from the lower leg. The second raises the first leg with soft springy movements. Option: the same, but fixing the final position of the leg.

76. I.P. - the first is standing on one leg, the other - to the side, hands on the belt. The second from behind, clasping one side of the partner by the side of the body, and the other, taking his raised leg from the bottom of the shin. The second with soft springy movements raises the first leg of the first up.

77. I.P. - the first in a rack on one leg, bending the other back, the knee to the side, the second, standing on the side of the raised leg, supports her hands with the knee and lower leg. The first is springy bends forward.

78. I.P. - sitting facing each other at an elongated leg, bending one leg back, a knee in a side, and leaning the foot of the straight leg on the partner's knee, hands of the same name forward, connecting them in the usual grip or grip on the thumbs (if your right legs are bent, then hold with your right hands, and vice versa). Alternating tilts back and forth, helping each other.

79. I.P. - the first - sitting, bending one leg back, knee to the side, the second in the leg stance apart sideways facing the partner. The first - springy inclinations to the straight leg, the second, bending over, presses his hands on the partner's back.

80. I.P. - the first, lying on his back, hands up, holding his hands on the lower leg of the second, the second in a knee rack on the side of the head of the partner facing him.

Options: 1) the first lifts the leg up, the second, taking the partner by the toe, presses his leg to the body; 2) the same, but two legs at the same time, holding them apart or together.

81. I.P. - stand with your back to each other, join your hands down. Raising your hands up - out, simultaneous attack of your right with an inclination back (bending) and springing movements forward - push the right leg back into IP; same with the left foot.

82. I.P. - gray on heels, back to back, arms to shoulders, joining hands. Stand up on your knees with a tilt back, arms up and stretch forward.

83. I.P. - a wide leg stance apart, back against back to each other, arms up, joining hands. Bending the opposite (first - right, second - left or vice versa) leg, lunge with a single or springy tilt towards the straight leg.

84. I.P. - the stand is flanked side by side to each other, raising the "outer" hands up and connecting their hands at the top and bottom. Simultaneous lunge to the sides with an inclination towards the partner (single and springy), with a push of the leg to return to I.P., making a circle without unhooking hands, the same way. Partners in I.P. can stand in one direction; face in different directions.

85. I.P. - the stand is right in the back of the head to each other, the first from behind, having threaded hands forward, covers the chest of the second. The first, making turns in place to the left (right) by stepping, rotates the partner in a circle.

86. I.P. - the first, lying on your back (stomach), legs straight, arms up. Partners, taking the arms and legs of the first, slowly pull them, leaning back. As soon as the torso is torn off the floor, the first should raise the pelvis up so that there is no deflection in the lower back. After 5-7 seconds stretch gently lower into I.P. (photo 16).



Photo 16. I.P. - the first, lying on his back (stomach), legs straight, arms to the fan. The partners, taking the first by the arms and legs of the first, slowly pull them, leaning back

87. I.P. - the first lies, legs straight, arms up. The partners, having taken the first hand and foot of the same name, gradually pull the first into the vis. His free arm and leg, tearing off the floor, tense at an angle of 45° . Duration of stretching - 6-7 s. Then the partners, relaxing their hands and leaning forward, lower the first to the side and lower their backs to the floor by moving their hands to the right or left.

88. I.P. - the first, lying on his back, legs straight, arms up. One of the partners takes hands, and the second - by the legs, and raise the first, then transfer the hands to the holder of the legs, and the one who holds the legs takes his hands. Stretching is done with light, smooth movements without jerking. Duration 6-7 sec. Then there is a return to I.P.

(photo 17).



Photo 17. I.P. - the first, lying on his back, legs straight, arms up. One of the partners takes hands, and the second takes legs and lifts the first, then hands are passed to the one who holds the legs, and the one who holds the legs takes his hands. Stretching is done with light, smooth movements without jerking

89. I.P. - lying on your back (stomach), legs straight, up. Rolling from back to stomach

(back) to roll along the gymnastic path (photo 18). Option: roll over from a small hill-

III.



Photo 18. I.P. - lying on your back (stomach), legs straight, up. Rolling from back to stomach (back) to roll along the gymnastic path

90. I.P. - Stretching with rubber (elastic bandage). The practitioner lies on his back, legs are straight, arms are along the torso. On both legs, closer to the ankle joint, felt cuffs are attached with laces. An elastic bandage is attached to the cuffs at one end, the other end of the elastic bandage is attached to the wall, to the headboard, etc. A second pair of cuffs is worn on the shoulder joints. An elastic bandage is also attached to the cuffs, in the same way as in the first case. Stretching is from 1 minute to 5-7 minutes. Perform the first stretches with minimum and medium tension. Subsequent classes can be carried out immediately with a maximum effort (15-25 kg). For those who want to grow up, we recommend using this device during night sleep, those. learn to sleep in stretch. In this case, the tension of the bandage should be minimal, not to cause pain. You can sleep in a stretch 2-3 times a week. Rubber (elastic) bandage can be purchased at pharmacies.

JUMPING - “STORAGE GROWTH”

The load, which is dynamic and pulsating, is particularly pronounced for bone growth. Hops, jumps, swimming are all examples of just such a load. How does it affect growth? But what. The systematic irritation of the “growth zones” of long tubular bones, the very nature of the movements facilitates filling them with multiplying bone cells, stimulates growth processes, and stretches the body. Everyone who wants to grow up needs to remember this. Moreover, when performing jumps, each of them must be tried to perform in full force. The simplest example of this is a jump from a place up, when a person strives to touch a ball suspended slightly above his personal record or a basketball hoop (photo 19). In this case, orientation is carried out on a specific distance to the target, and not on the vague desire to jump higher. Practice shows that in such (objectively targeted) exercises, the results increase significantly than with the usual orientation. Exercises with instant information about their implementation,

for example, using technical means and simulators, can be considered targeted. Here the desire in repetitions to exceed the level just reached is the main driving force in mastering the ability to show potential

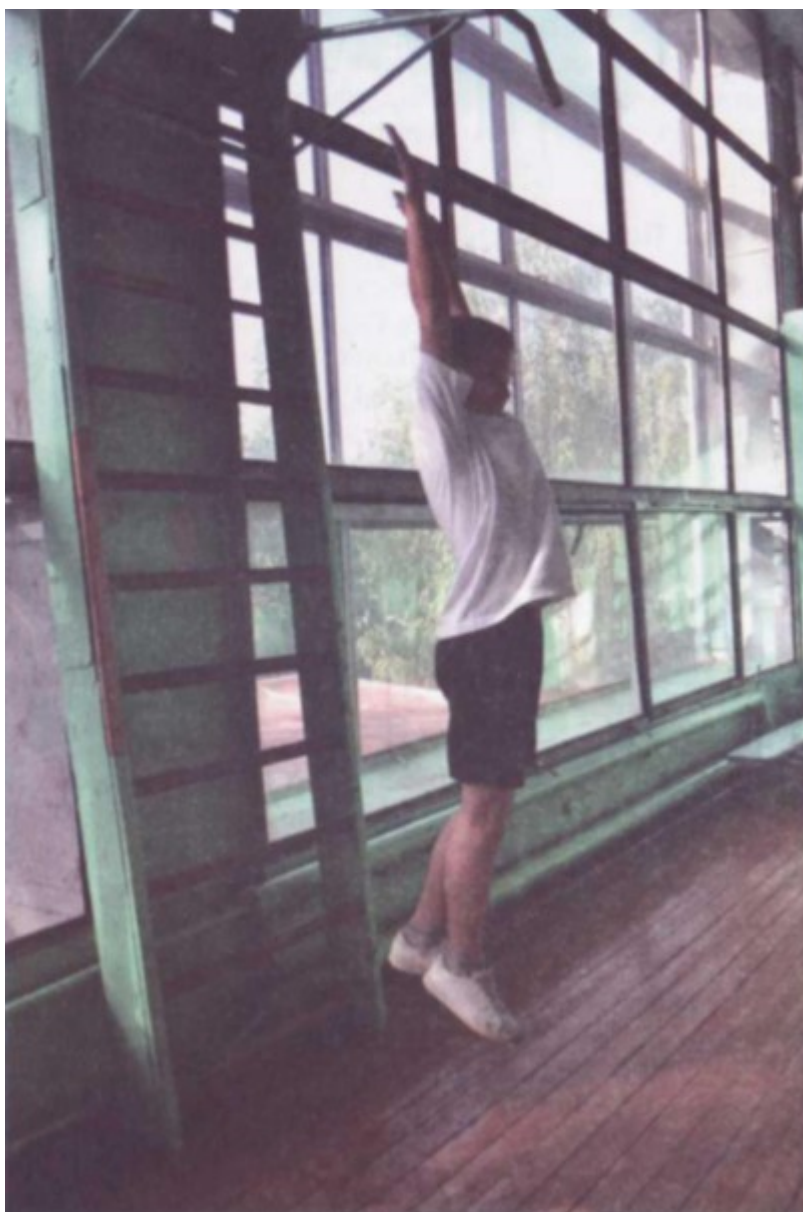


Photo 19. When performing jumps, each of them must be completed in full force.

For example, in our work, as one of the means characterizing the height of the jump and controlling it during the training itself, we use a setup consisting of a contact track and two electronchronometers mounted in one unit and fixing the time in hundredths of a second. One of them registers the support time, and the other the time of the unsupported phase of the upward jump, i.e. flight time. Depending on the tasks of the training, you can change the exercises and conditions of execution:

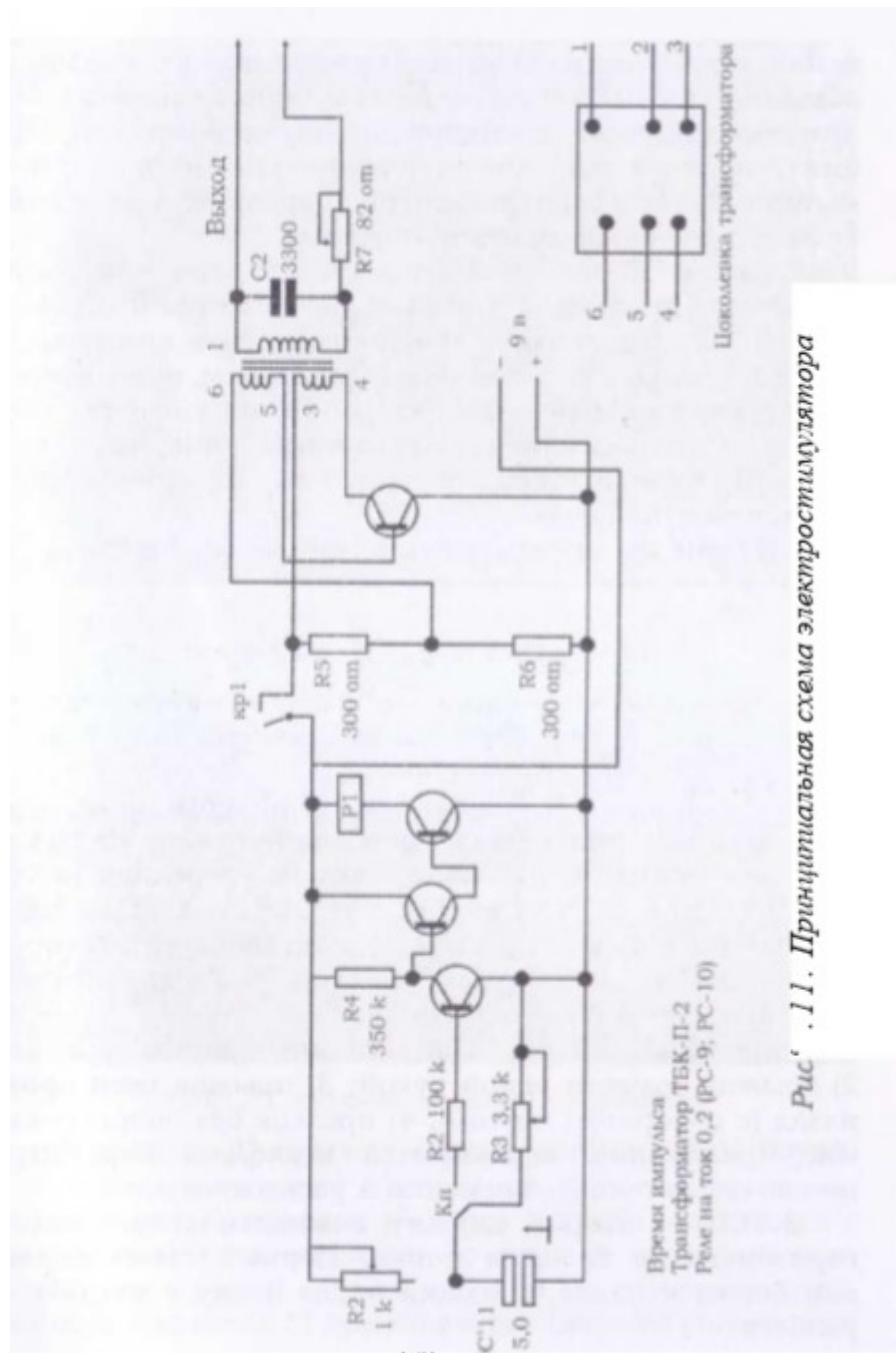
- 1) jumping in normal and light conditions (with the help of a partner);
- 2) jumps with pushing with one and two legs from a place and take-off;
- 3) the same with the delivery of an object suspended at a given height;
- 4) repulsion immediately after jumping from an increased support. It should be noted that comparing the results after doing the exercises enhances the emotional side of the session.

Based on the proposed above-mentioned exercises, you can make any complexes and use them in various combinations, taking into account the individual characteristics of the students. In a number of means, objective focus is combined with elements of risk, which increases the emotionality of the practitioner and sharply increases his volitional orientation and efforts. For example, long and high jumps over solid obstacles, including on the ground, upside down jumping from one wooden box without a bottom to another, third, etc., located from each other at different distances and directions. At present, it is possible to create exercises, the implementation of which is connected with the inevitability of the required action, when the student is placed in conditions that force him to do with inevitable force that which is very difficult physically and psychologically, but it is necessary and possible.

One of such means is the method of electrical stimulation activation of muscles (electrical stimulation). It should be used by older students as an addition to existing means and methods of individual training. The main theoretical provisions of electrical stimulation were formulated by N.E. Vvedensky, who believed that the most physiological mode of stimulation of skeletal muscles is tetanic irritation, and the frequency is the one at which the largest amplitude of contraction is observed. For those who intend to use the method of electrical stimulation in their studies, I will give the parameters that should be provided for in the manufacture of the electrical stimulator itself:

- a) the rectangular shape of the pulses;
- b) setting the duration of a single output pulse from 0.5 to 1 s; c) adjustment of the pulse frequency (from 1 to 100 Hz); d) adjustment of the time during which the stimulation occurs;
- d) arbitrary (from 0.5 V to 250 V) adjustment of the output voltage; e) the delay between the start of the stimulator and the output signal.

All these requirements are met by an industrial electric stimulator ESU-1. In our work, we also used a home-made small-sized electric stimulator, the circuit diagram of which is shown in Fig. 11. How to use the method of electrical stimulation can be found in the relevant literature. To increase the effectiveness of the jump, I also recommend exercises with a ballistic (tensile) characteristic of muscle activity. The simplest example of such exercises is a high jump with a jump. When performing such exercises



Рис' .11. Принципиальная схема электростимулятора

.eleven. Schematic diagram of the electrical stimulator

After stretching, and the muscles have high elasticity, they contract faster and stronger. In particular, this effect manifests itself when stretching a tense muscle. And the faster this stretching, the greater the effect of the "return spring". A great and useful effect for enhancing growth is jumping when they are performed in a playful way. Game tasks can be performed in different ways. In one case, as a normal exercise of applied or competitive nature, when partners train in mastering the technique of its implementation, in another - as a competition game, conducted according to predetermined rules. Jumps can be included as separate tasks in the relay races of the obstacle course.

Sample game tasks:

1. Playing basketball on one ring. The main task is to jump more, fight for the ball bouncing off the shield.
2. "Leapfrog". I.P. - the second leg in the leg apart from the right (left), the back is round, tilting your head forward and resting your straight hands on the knee of the "front" leg, the first behind several steps away. The first one with a run performs a leg jump apart through the partner and takes the initial position of the second. Now the jump performs the second, etc. (photo 20).

Options: 1) jump with two hands; 2) jump with one hand push; 3) jump legs apart back (with a turn around); 4) jump without support with hands. Note: several pairs compete. The game can be limited by time and distance. 3. I.P. - the second holds the gymnastics stick horizontally at one end. The first is facing or sideways to the stick. Jumping from a stick from a place and from a start.



Options: 1) jump bending legs push two; 3) a jump with legs bent by pushing one leg with a landing on two; 3) jump in the “step” with the push of one leg with landing on the flywheel; 4) a jump on one leg (left or right) with a landing on a push (the other leg is tightened); 5) jump to the left (right) with legs bent

push by two; 6) jump by "stepping" to the left (right) by the push of one leg with landing on the flywheel. Gradually, the height from the floor to the stick increases. 4. I.P. - the stand is facing each other at a step distance, the first one has a ball between the feet. The first jumps and tries to throw the ball over the second. The task of the second is to catch the ball. If the second manages to catch the ball - they change places. 5. I.P. - stand facing each other at a distance of half a step. The first holds the rope, the second - hands down (or holding the partner's belt). Jumping together: 1) turning the rope forward (relative to the first); 2) turning the rope back. 6. I.P. - stand in the back of the head, the first in front holds the rope, the second holds the partner by the belt (or hands down). Jumping together: 1) turning the rope forward; 2) turning, the rope back. These jumps can be performed both locally and with advancement, backward, sideways. 7. "Fighting roosters." I.P. - standing with the right (left) side to each other on the right (left) leg, bending the other leg back and holding the sock with the hand, the other hand behind the back. Partners stand in a circle with a radius of up to 2 m. Jumping on one leg and pushing each other with a shoulder, make the partner leave the circle or stand on both legs. 8. Jumping through a long rope. The second (or trainer), standing in the center of the circle, rotates a long rope, which holds at one end. The first (or the whole group) jump over a long rope. Jumping can be performed on two and one leg. The task is complicated by a gradual increase in the height at which the rope is rotated (photo 21). To all of the above, it is necessary to add the following: both short-term loads - light bouncing of low intensity, and overly

large and long (thousands of jumps per day) do not significantly affect growth. It was found that such loads do not lead to an increase in growth hormone in the blood. The first - due to insufficient stimulation of the neuroendocrine system, the second - due to their depleting effect on the body (due to the high cost of calcium).



Photo 21. Long jump rope

This fact is confirmed by the research results of the famous Moscow anthropologist professor). Martirosova. The scientist, observing adolescents training in weightlifting sections, came to the conclusion that they, contrary to expectations, are above many of their> nests. True, only if the trainer brushes them a load of moderate power. How can a body react to such a load directed directly at the “growth zones” of bones? Only a response in the opposite direction, a peculiar ..itsitic resistance. In other words, amplification of multiple processes. As soon as the load exceeded admissible, this resistance was suppressed, growth slowed down.

At the same time, pathology began - intervertebral discs were compressed, the arch of the foot was flattened, etc. Therefore, when using jumping in your training regimen as a means of helping you grow up, you need to remember that success depends on the right choice of the golden mean, on a rational combination of different options not only in form but also in duration.

CAN I IMMEDIATELY GROW?

A person's height changes during the day: in the morning he is 1-3 centimeters higher than in the evening. This is mainly due to the height of the spine, which is not a solid vertical pillar, but an elastic-elastic rod with mandatory so-called physiological bends: two anteriorly, two posteriorly. And if there are bends, then the actual height of the spine (from head to tip) is less than its length with complete relaxation. Naturally, the more pronounced the curvature of the bends, the more uniform the length of the spine, the less its height, which is directly related to the growth of a person and is reflected in the readings of the stadiometer. The difference between the length and height of the spine can be very significant in stooped people, sometimes exceeding 10 centimeters. Therefore, having corrected his posture, a person becomes taller. The stoop is stealing from us these centimeters. It is caused primarily by muscle weakness - the extensors of the spine. There are many exercises that strengthen these muscles and, therefore, help to get rid of stoop. Well, the main thing is to constantly monitor your posture. The American circus artist F. Villard for many years showed such an amazing number: he went to the arena (an ordinary person of average height), and then began to increase his height in front of the public. Within a few minutes, Willard grew taller by 20 centimeters! Scientists took x-rays right during the artist's performance of this stunning number and found that Willard, relaxing some of the muscles of the spine and straining others, maximally straightened all four

physiological bends spinal column. It was due to this that his growth became more than a whole head. To correct posture, experienced methodologists advise to stand against the wall so that the back of the head, shoulder blades, buttocks and heels touch its surface, and then maintain this position for as long as possible. This exercise is necessary several times a day. Another remedy for stoop is swimming breaststroke. If we look at history, we will find out that in pre-revolutionary cadet schools in Russia such measures were applied to correct posture. Sutured teenagers tied an ordinary board to their backs. By itself, this measure did not have any orthopedic effect, since it did not train the back muscles, but the psychological effect was quite noticeable. One hour of wearing the board was enough to constantly fix their attention on the correct posture. This skill was especially well mastered when adolescents were given the task of doing all kinds of balance exercises (walking on a narrow board, log, beam), constantly monitoring posture. At the same time, not only the psychological factor acted, but also the physiological one - the muscles that held the body in the correct position were strengthened. It is easiest to correct defects in posture at a young age, when a person is still growing. If a teenager is very slouching, he is prescribed exercises that strengthen his back muscles. The earlier he starts performing these exercises, the sooner the effect will be. Regular exercises correct a stoop of two to three months with very serious work on oneself. In an adult, these exercises are unlikely to lead to changes in the configuration of the spinal column, but even here, a strong muscle corset largely compensates for curvature, in any case, outwardly, it can become completely invisible. The main thing is constant monitoring of your posture. A person, even having a slightly curved spine, must force himself to walk with his head raised and shoulders unfolded. Very soon, such a posture will become familiar and will not require additional attention from him.

In the Polish magazine Sport for Vshists, the following lines were printed: “A man who walks beautifully looks slimmer and taller. Each of his steps should begin not from the lower leg, but from the hip, lower back - forward, straight back, head raised. Psychologists believe that a lowered head and a hunched back indicate passivity, timidity, self-doubt. Men! Straighten, turn your shoulders! One must go through life with one's head held high! ”It is beautifully said. And rightly so. With hard work due to improved posture, everyone can add a few centimeters of growth, even one who has run out of growth. The fulfillment of sets of exercises by persons who continue to grow will help to increase their growth. For those who want to practice, we offer several sets of exercises. You can do it at any time, but not earlier than 1.5-2 hours after eating. It is also not recommended to start classes in a state of overwork, exacerbation of chronic and acute diseases.

The first set of exercises

1. To control the posture against the wall, move as far as possible, while maintaining the correct position of the body.
2. Spring bending forward bending. Repeat - 12-14 times.
3. Holding the position by bending, actively moving the shoulder blades back. Repeat 12-14 times.
4. Swing backwards, look straight ahead. Repeat 20-30 times with the right and left foot.
5. In the knee rack, bend, lean on the heels and hold this position. Repeat 10-12 times.
6. Standing a step from the wall, bend down, holding the position of 7-10 s. Alternate with leaning forward. Repeat 6-8 times.

The second set of exercises

1. Hands are wound behind the back, fingers of both hands are bound “into the lock” and are extremely close to the shoulder blades. With force, leaning your hands on your back, take your elbows and shoulders back, at the same time tilting your head back.
 2. Lie on your back, arms to the sides. Try to bend your back above the floor as high as possible, resting against the floor with the back of the head and buttocks.
 3. Kneeling and holding hands on the heels, bend chest forward, tilting your head back.
 4. Lie on the stomach, palms on the back of the head, and fix the feet under the gymnastic bench or other object. Raise the body and head up - back as high as possible, while spreading and raising your elbows.
 5. Sitting on a chair (palms on the back of the head), bend forward strongly with your chest, and lay your head back.
 6. Lying on your back and resting your hands (near the head) and feet on the floor, make a "bridge".
 7. Standing with your back to the wall, tilt your head back in order to touch the wall with your forehead. Every day you need to do 3-4 exercises, repeating each 12-15 times.
- Classes spend 2-8 times a day.

The third set of exercises

1. I.P. - standing, feet shoulder-width apart, circular movements of the hands forward alternately in the wrist, in the elbow and shoulder joints. Repeat 10-12 times. Hands down, relax. Repeat the same in the opposite direction.
2. I.P. - stand legs together, arms in front of the chest are bent at the elbows. Straightening

your arms, spread them back. Bend and stretch, right foot back to toe (inhale). Return to I.P. (exhale). Same thing, leaving the left foot. Repeat 10-12 times at a slow pace.

3. I. P. - stand legs apart, hands behind the head. Tilts to the right, arms up (exhale).

Return to I.P. (inhale). Do the same the other way. Repeat 10-12 times at an average pace.

4. I.P. - Standing, feet shoulder-width apart, raise your hands up and clasp "lock", stand on your toes and stretch your whole body strongly, then lower your hands, clasp your fingers "lock" behind your back, stand on your heels, raise your socks. Repeat 10-12 times.

5. I.P. - stand legs apart wider. Hands through front up (inhale). Spring tilts forward to the left, fingers touch the toe of the left foot, fingers touch the toe of the right foot (exhale). Return to I.P. Repeat 10-12 times at an average pace.

6. I.P. - standing, feet shoulder width apart. Bending back, try to reach your heels with your fingers. Repeat 20 times.

7. I.P. - while standing, bend the right leg at the knee and press the foot to the knee of the left leg. Leans forward, touching the floor with your fingers. Repeat 10 times on each leg.

8. I.P. - take your hands back and grasp the crossbar of the Swedish wall or the back of the chair (approximately blade level). Squat without releasing hands. Repeat 20 times.

9. I.P. - emphasis lying behind (turning your back to the floor), bend forward. Flexion and extension of the arms. Breathing is arbitrary, but without delay. Repeat 10-12 times.

10. The same, but the emphasis on the windowsill or table.

11. I.P. - lying on his back, hands on his belt. Slowly raising your legs forward, touch the floor with socks behind your head. Repeat 15-20 times.

12. I.P. - lying on his stomach, arms up. Raising arms, head and legs, bend (inhale).

Return to I.P. (exhale). Repeat 10-12 times.

13. I.P. - sitting on the floor, legs straight. Lean forward, reach the tips of the toes with your hands, and knees with your head. Repeat 15-20 times.

The fourth set of exercises

1. I.P. - standing, feet shoulder width apart. Tilts the head to the right and left, trying to touch the shoulder of the ear (without lifting it). Repeat 10-12 times in each direction.

2. I.P. - standing, feet shoulder width apart. Leans forward, touching the floor with your fingers (palms). Repeat 20 times.

3. I.P. - standing, legs together. Leans forward, touching the forehead of the knees. Repeat 20 times.

4. I.P. - emphasis, kneeling. To bend and lift the right leg back (inhale). Return to I.P. (exhale). Run the same with the other foot. Repeat 10 times on each leg.

5. I.P. - emphasis kneeling. Left hand up, right hand back (inhale). Return to I.P. (exhale). Perform the same with the other leg and arm.

6. I.P. - lying on his stomach, arms up. The right leg is on iad (inhale). Return to I.P. (exhale).

7. I.P. - lying on his stomach, arms up. Take both legs back (inhale). Return to I.P. (exhale). Repeat 18-20 times.

8. I.P. - sitting on the floor, one leg in front, the other bent at the knee. Leans forward, touch the floor with your hands. Repeat 20 times.

9. I.P. - lying on your back, arms up. Raising his hands, head and legs, reach the fingertips with his hands. Repeat 15-20 times.

10. I.P. - lying on his stomach, legs straight, arms along the body. Raise your head, shoulders, legs, grab your legs with your hands and stretch up ("basket"). Repeat 15-20 times.

11. I.P. - kneeling, emphasis on arms, shoulder width apart. Lean forward while sitting on your heels, with outstretched hands touch the floor, lower your head. Repeat 15-20 times.

12. I.P. - sitting, legs folded "in Turkish", hands in front of the fingers "in the castle". Raise your arms and stretch as far as possible. Repeat 15-20 times.

The fifth set of exercises

1. I.P. - standing, legs together. Raise your arms above your head, take a deep breath, slowly lean forward, touch your toes with your hands - exhale. Hold in this position for up to 7 seconds. Return to I.P. - a breath. Repeat 4 times.

2. I.P. - lying on his stomach. Take a deep, slow breath, raise your head as high as possible. Then, straining the muscles of the back, raise the shoulders, bending the torso back, leaning slightly on your hands. Save pose 7-10 seconds. Then return to I.P.

3. I.P. - lying on his back, arms to the sides, palms to the floor. Raise your legs up 45 ° and then, after a pause, to a right angle. The breath is slow, deep. Move the legs behind the head and stay in this position for 6-7 seconds. Then slowly lower them behind their heads, touch the floor with their fingers, straighten their knees. The breath is deep.

4. I.P. - lying on his stomach, hands behind his head. Raising your head and shoulders,

bend (inhale). Return to I.P. (exhale). Repeat 1012 times

5. I.P. - lying on your back, muscles are relaxed. Slowly raise your legs at an angle of 90° to the body. Leaning on hands and elbows, make a stand on the forearms and remain in this position for 2030 seconds, then return to I.P. and relax. The breath is slow, deep.

6. I.P. - lying on your stomach, legs together, bend your arms at the elbows and put at the shoulder level with your palms down. Raise your torso as high as possible. Tilt your head back. The breath is arbitrary. Turn left to see the heel of the right foot (legs and arms remain in place, do not tear the lower abdomen off the floor), then turn right to see the heel of the left foot. To bend up, back and fall down again in I.P. Repeat the sequence up - right - left - down, linger in each position for 6-7 seconds.

7. I.P. - sitting "in Turkish", tilt your head back and slowly leaning forward, touch the crown of the floor, stretch your arms along the body. Keep this position for 7-10 seconds. The breath is deep, slow. Return to I.P., resting his hands on the floor.

8. I.P. - stand, leg apart, arms bent at the elbows in front of the chest. Take your elbows back and bring the shoulder blades closer, relax your arms and back, drop your hands down, leaning slightly forward (exhale). Return to I.P. (inhale). Repeat 10-12 times.

9. I.P. - stand on the shoulder blades, supporting the torso with your hands. Keep this position for 20-30 seconds. Breathing is arbitrary, without delay.

10. I.P. - lying on your back, arms to the sides or down, palms on the floor. Circular movements with straight legs to the right. Return to I.P. Same to the left. The breath is arbitrary.

11. I.P. - lying on the right side, the right hand up (lies on the floor), leaning with the bent left hand on the floor. Raise your left foot (inhale). Return to I.P. (exhale). That ke

lying on the other side.

12. I.D. - Vis on a low crossbar. (Grab top or bottom). Leaning feet on the floor so that an angle of less than 45° is formed between the legs and the supporting plane. The body is straight. Bend your arms until the chin crosses the crossbar line. Return to I.P.

Breathing is arbitrary, but without delay. In the apartment low The crossbar can be a shelf or a pipe, placed between the backs of two chairs, standing with the seats outside.

Sixth complex of exercises

(Exercises with a gymnastic stick in the hands)

1. I.P. - stand facing each other at a large stride distance, stick grip from the bottom.
Options: 1) sticks through the sides up, stretch - return to I.P., the same, climbing toes;
2) bending arms, sticks to shoulders - sticks up, stretch - sticks to shoulders - sticks down; same, climbing on toes. The same options with alternate movements of the hands (to the sides - up - to the sides - down); with the legs to the side on the toe or step to the side in the rack with their backs to each other.
2. I.P. - stand legs apart (or together) with your back to each other, stick at the top, both grip shoulder-width apart. The first leans forward, the second, bending, lies on his back.
3. I.P. - the first lying on his stomach, stick up, grip shoulder-width apart (arms on the floor). The second leg in the leg apart above the first in an inclination forward, taking the stick by the ends. The first, raising his arms and body, bends backward, the second, straightening up, helps his partner. Option: the same, but the first holds a stick behind his head.
4. I.P. - the first in gray legs apart, holding a stick behind his head and slightly leaning back, leaning it on the hands of a partner lying behind; the second - lying on his back

with his head to the first, arms forward - up with a grip on a stick shoulder-width apart. The first, lifting the pelvis, bends.

5. I.P. - the first is lying on his back, the second is standing on the side at the feet of the partner, holding a stick with one hand at the end. The second puts the stick down on the floor and carries it from head to foot under the partner. The first one raises his legs, pelvis and, first bending in the lower back, and then raising the body, skips the stick, trying not to touch her body.

6. I.P. - stand legs apart, with the right (left) back to each other at a large stride distance, the sticks are directed up and back, grasping at the ends. Options: 1) the first - both sticks back, the second has resistance, then vice versa; 2) both partners take the sticks with their right hands back, with the left they show resistance, and vice versa (alternately); 3) the first pulls both sticks forward, the second exerts resistance, then vice versa; 4) both with their right hands pull the sticks forward, with their left they put up resistance and vice versa (alternately).

7. I.P. - stand legs apart facing each other at a great stride distance, sticks up - forward with a grip on the ends. Circular movements of the body in one direction and the other (several times alternately). Option: the same, but with your back to each other.

8. I.P. - stand back against each other, stick up, both grip shoulder-width apart. The first leans forward, the second lies on the back of the partner and bends.

9. I.P. - the first lying on his back, legs bent, feet on the floor, arms forward - up, grasping a stick shoulder-width apart; the second in a lunge from the side of the partner's head, facing him holds a stick on the knee of the bent leg. The first, bending, assumes the position of "bridge". The above exercises strengthen the muscles of the

back and neck, help maintain proper posture. The effect will be even greater if the person himself constantly makes sure that his shoulders are deployed and his head is raised.

MAKE YOUR SWIMMING!

Swimming is one of the most effective means to increase growth. Swimming exercises harmoniously develop the limbs and almost all muscle groups - especially the shoulder girdle, arms, abdomen, back and legs, eliminate flat feet. In the Italian newspaper Imperia, an interview was published with film actress Sophia Loren, she said that she had been swimming for 30 years to lengthen her legs. Classes in the pool yielded exceptional results - she managed to “stretch” her legs by 9 cm. Doctor of Medical Sciences, professor of the research institute of age-related physiology B.A. Nikityuk commented on this fact: - Indeed, specialists have long been investigating the effect of intensive swimmer training on the formation of structural muscle tissue. Studies conducted in the laboratories showed that swimming in the literal sense of the word forms the body and helps to build a harmonious figure. Experiments over the past two decades have shown that swimmers can lengthen their legs by at least ten centimeters. What Sophia Loren was able to achieve is, in principle, a common occurrence. There is a known case when a girl who set herself the main goal to become "Miss Russia", with the help of swimming, extended her legs by 15 centimeters! Swimming perfectly trains the cardiovascular and respiratory systems. In people who systematically engage in swimming, the magnitude of the stroke volume of the heart increases, the heart rate at rest decreases from 60 to 55 (50) beats per minute. For comparison: in people who do not engage in sports, the heart rate usually ranges from 65 to 57 beats per minute. Swimming exercises strengthen the external respiration apparatus, develop the correct breathing rhythm,

enlarge the vital capacity of the lungs (VC). Swimming strengthens the nervous system, improves sleep, sleep, metabolism. Swimming lessons are developed by such physical qualities as strength, speed, joint mobility, and coordination of movements; they also form a “muscle corset” in a timely manner, contributing to the development of good posture, preventing curvature of the spine and eliminate irritability and irritability. Children swimming regularly are markedly different from their peers who are not involved in sports; they are growing, have higher rates of JEA, weakness, strength, are less prone to colds (nations. In addition, scientists have found that people who regularly engage in swimming grow and after 20 years, when natural growth The data cited by Professor B.A. Nikiti, supported by archaeologists, studies the culture of ancient Rome, and it turns out that the most extreme women in Rome spent at least seven hours daily in bathhouses, often even having lunch in it to and took the dishes on the floating their trays. In piiiimi pity Terme Caracalla, where they were equipped with swimming pools, poetry celebrations were held, <| »they have debates and beauty contests. In one of the • poems, Ovid, a witness of these meetings, wrote: I want not only the body, but also the mind. ”With all this in mind, we recommend that anyone who wants to be III niche tall should make friends with swimming. I I miy other methods that are more economical and ИДИИИ, because their equipment is built taking into account the physical ■ " i to the new navigation and anatomical regularities of I n • h m iishi human body. \ Let us get acquainted with swimming methods.

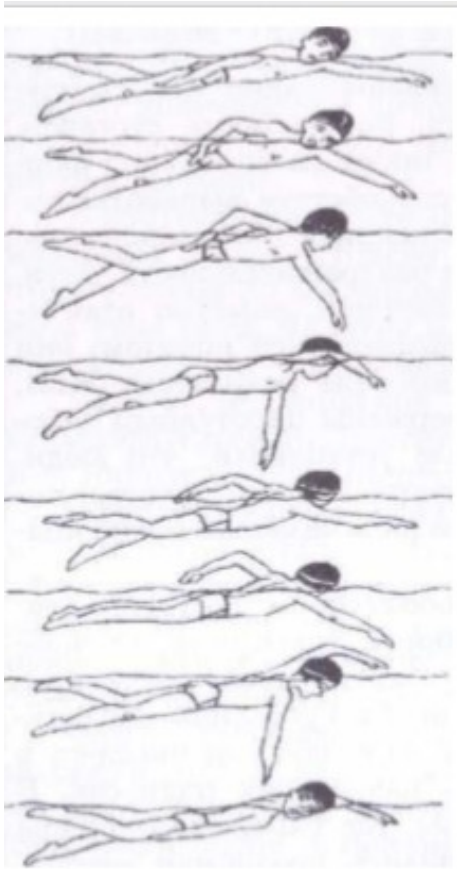


Fig. 12. Technique of swimming in the way of crawl on the chest

Crawl on the chest

When the crawl is swimming on the chest, the swimmer advances with alternate hand strokes and up and down legs. After the stroke, the swimmer takes his hand out of the water and carries it forward through the air. Hand movements provide the main thrust, foot movements help maintain a higher position of the body in the water, as well as promote forward movement. Inhale is done by turning the head to the side (Fig. 12).

Body position

The swimmer lies on the surface of the water almost horizontally, in a well streamlined position at an angle from 0 to 8 °. The swimmer's shoulders turn left and right relative to the longitudinal axis of the body, facilitating the exit of the hands from the water, they move through the air and make it possible, when performing a hand stroke, to actively engage the muscles of the body. The turn of the shoulders (up to 50-60 °) occurs when inhaling in such a way that the body is shown from the water. The position of the head depends on swimming speed. It should ensure the dynamic balance of the body, the implementation of inspiration and not violate the correct execution of stroke exercises. Face down

and it is so that the swimmer's body remains in the horizontal position. Hand movements contribute to the promotion of the body and the maintenance of the shoulders slightly higher than the surface of the water. The hand enters the water first with a brush, and then with a shoulder and a shoulder, so that you can quickly and quickly get a stroke. The main part of the stroke is performed with a slight turn of the swimmer's body to the side, to the throne of the rowing hand. This makes it possible for the swimmer to pour the stroke with his hand due to the powerful muscles of the body. Foot movements contribute to the balance of the body and the beginner in a horizontal position and the advancement of it is aided. The swimmer's legs, rhythmically bending and unbending in the line to the hip, knee and ankle joints, alternately move up and down, the working part is the legs - the movement of the foot and lower leg from top to bottom.

Crawl on the back

I When learning the technique of swimming, the crawl on the back is mastered faster than the crawl on the chest. This happens because when swimming on the back, you do not need to make it water - the most difficult element for beginners and swimming balls. I is the swimmer lies on the back while the crawl is swimming. "The surface of the water is almost horizontal, the back of the head is not water. He moves forward with the help of the bottom strokes with his right and left hand and alternating movements of his legs from top to bottom and from bottom to top. For stroke, the hand comes out of the water and sweeps forward"; by air. To perform one cycle of movements of the crawl 2 strokes with his hands, 6 movements with his legs, inhale and exhale (Fig. 13). 1 and 2 to the movement of arms and legs subordinating - to the arms. Leg movements are performed rhythmically and evenly. For calm swimming, the circular movements and pin are characterized by circular uniformity of

movement • • and and | and kppm, the presence of an influx, subjective sensation ease of movement and the visual impression of freedom of movement. Inhalation is performed at the end of the stroke with one hand, and exhalation continues for almost the rest of the movement.

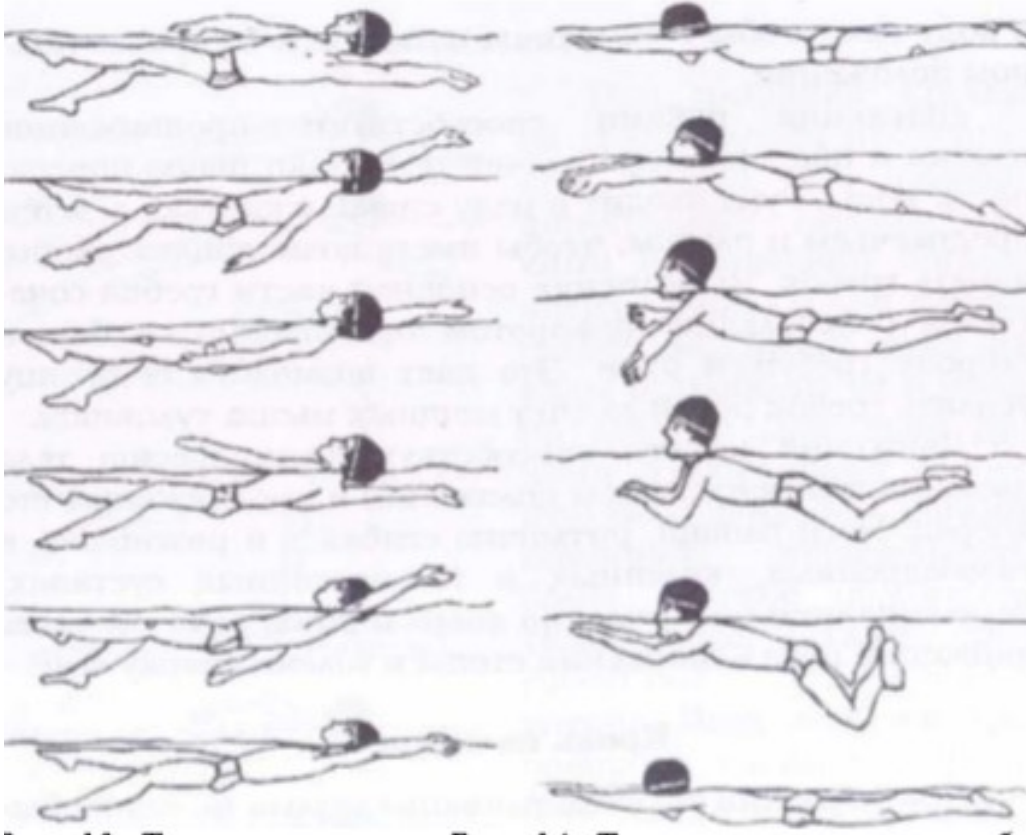


Fig. 13. Swimming technique

Fig 14. Technique of swimming using the crawl method on the back using the breaststroke method

Breaststroke

Compared to other swimming methods, the breaststroke is the least tedious (since preparatory movements are performed under water), therefore it is easy to learn in training. When breaststroke, the swimmer lies on the surface of the water on his chest and moves forward with simultaneous symmetrical strokes with his arms and legs. Inhalation is performed at the beginning of the stroke with your hands; exhalation into the water coincides with a push with your feet.

The technique of swimming breaststroke is diverse. We will give ■ a description of the swimmer's movements with the classic breaststroke, which ■ ■ ipi.iñ is usually used in swimming training (Fig. 14).

A swimmer lies on the surface of the water on his chest with his arms and legs confused. Hands are straightened, palms are turned down. The brassist should avoid excessive propp in the lower back when inhaling and during the kick. Hand movements provide the swimmer with advancement and support of the head and shoulders at the surface of the hearth for inspiration. The cycle of movements consists of a stroke and putting your hands forward - preparing for the stroke. The swimmer begins to stroke with his arms from the position of ■ sling with outstretched arms and legs. The rower stumbles from the spread of the arms to the sides - down. Then, flatly, bending the arms at the elbows, he actively includes the forearm in the stroke. During the stroke, the swimmer leans against the water with his • feet and forearms. At the end of the stroke, the elbows approach the body, and the hands - to the chin. Hang your arms forward immediately after the stroke. The end stroke, the arms are bent at the elbows and at the same time 1 m are led forward, the hands are approaching each other, the uni are facing down. Foot movements provide advancement of swimmer forward, help to maintain balance of the body in i> mental position. They consist of pulled up n push. Performing a jerk, the swimmer spreads the feet to the sides, and can be repelled from the water by the hips, lower legs and the inner surfaces of the feet. Legs gradually move i towards each other and straighten in laziness. After a kick with the feet, the swimmer slides forward in * '1 momentum, while the legs straighten, connecting with a • m" i ge and rising to the surface of the water. Those who want to work to increase growth, we recommend this phase and. tighten tightly, i.e. maximum slip phase * m. but lengthen.

Dolphin

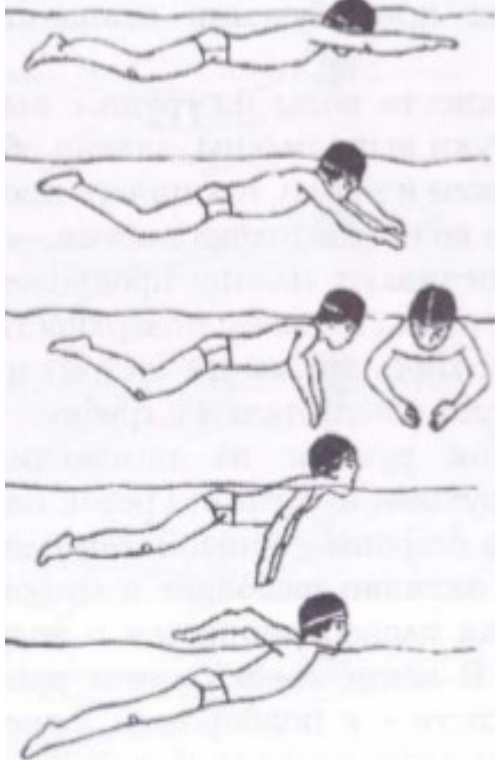


Fig. 15. Dolphin swimming technique

When swimming with a dolphin, the swimmer moves forward due to powerful hand strokes, performed simultaneously, and wave-like movements of the body and legs up-down and up. Inhale is done at the end of the stroke with your hands, and exhale lasts the rest of the movement time (Fig. 15). Unlike other swimming methods, where the position of the body is relatively stable, when swimming with the dolphin, the body moves up and down

actively in combination with arms and legs. The swimmer makes wave-sweeping movements with the body up and down in a vertical plane so that when the shoulders and feet lower, the pelvis rises, and vice versa. The angle of attack of the body when swimming at a slow pace varies from -20 to $+20^\circ$ and reaches a maximum when inhaling. The movement of the feet up is accompanied by bending of the legs in the knee joints, and down - by straightening the legs. As a result, the swimmer makes a sweeping stroke with his legs and body in the backward direction. For one cycle of leg movements, two hits are usually made, unequal in amplitude and effort. Usually, the swimmer accentuates the second blow, which falls at the end of the stroke with his hands and is performed during inspiration. Foot movements provide support to the body near the surface of the water and help the swimmer to actively move forward.

Hand movements are conditionally divided into immersion of hands in water, the influx and the supporting part of the stroke, the main part of the stroke, the hands coming out of the water and moving them above the water. After being carried over water, hands enter the water about shoulder-width apart, palms down. To avoid diving, swimmers, straightening their arms underwater, bend at the shoulder joints, absorbing the movement of the shoulders down or pushing the arms straightened under the water slightly to the sides. The influx begins after the hands enter the water. At this time, arms extended forward and the body make minor movements down - up. Influx can be observed when swimming at a slow pace. When swimming at a fast pace, it is almost invisible. In the supporting part of the stroke of the arm, moving down to the midline of the body, gradually bend at the elbow joints, leading the swimmer's shoulders up and forward. The supporting color of the stroke is completed by turning the palms and forearms into a plane perpendicular to the direction of movement of the swimmer, to further ensure the greatest traction. From this position, the swimmer begins the main, most effective part of the stroke. First, he directs his hands to the midline of the body, then ends the stroke with the movement of the palms to the sides of the hips; the elbows at the end of the stroke approach the surface of the water. In the main part of the stroke, the swimmer, as it were, captures iodine, bending his arms in the elbow joints and turning outwards. Then the swimmer vigorously pushes away from the fashion, sending his shoulders forward and turning his elbows in the torons. The end of the stroke coincides with the removal of hands from the war. When the shoulders approach a horizontal position, the elbows, leaving the water, move up and to the sides. Carrying over water is usually done with straight hands, with both hands moving forward through the sides.

For one cycle of movement, the swimmer has to inhale and exhale. A quick breath through the mouth begins at the end when the hands are removed from the water. After a short pause, exhalation occurs. To prevent water from entering the mouth, the end of the exhalation is done with reinforcement. The coordination of movements of the arms and legs with breathing occurs as follows: one of the kicks down is performed when the hands enter the water, the second is done at the end of the stroke. Inhale is done at the end of the stroke with your hands, exhale after a short pause. When working on increasing growth, we recommend a slow swimming pace.

The content of swimming lessons

The content of swimming lessons should correspond to the set goal, age and preparedness of the students. Swimming training can be carried out both independently and in the form of group exercises, which are more effective, since they have an inherent element of competition. Not able to swim, the example of comrades helps to overcome fear and self-doubt. The fastest way can be taught to swim crawl on your back, breaststroke. This is largely associated with easier breathing, since when swimming with these methods, you can not exhale into the water. More time is required to study the rabbit on the chest, which is explained, as already mentioned, by the need to exhale into the water. And, finally, the most difficult thing is to learn the “dolphin” technique, since before you start mastering this method, those who are involved should master the crawl swimming technique.

Water exercises

1. Slip on the chest. Standing to the chest in the water, bend so that the chin touches the water. Stretch your arms forward with your thumbs together. Make and doh, gently lie down on the water face down and, pushing your feet off the bottom or side of the pool,

take a horizontal position. Glide with outstretched legs and arms over the surface of the water.

2. Slip on the back. Stand with your back to the side, arms along the body. Take a breath, hold your breath, crouch, slightly pushing off your legs, lie on your back. I I Raise the abdomen and press the chin to the chest. It should be remembered that a steady position on the back is facilitated by light rowing movements of the brushes around the body (palms facing down).
3. . Sliding on the chest with different positions of the arms: arms extended forward, along the body, one arm in front, at the hip.
4. Sliding on the back with different positions of the hands: arms extended forward, along the body, one arm in front, the other at the thigh.
5. Slip on chest followed by turning mi on the back and chest.
6. Stretching with the help of partners (photo 22).

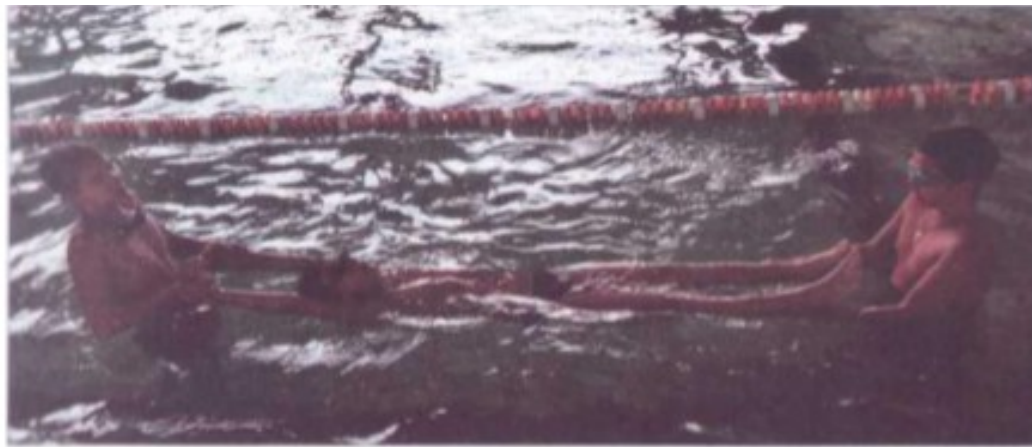


Photo 22. Stretching in water with a partner

Games on the water Games on the water awaken the students' aspirations ■ it is better to complete the task, make the lesson more

emotional, increase interest in swimming.

1. "Who is taller?" Standing in the water, crouch, kick off the bottom and jump out of the water as high as possible. Option: the same, but trying to touch the flying ball.
2. "Glide forward." The players stand in a line and slide on their chest and back.
3. "Torpedo". Team players perform a slide on the chest with a crawl of the legs. Then they do the same on their backs.
4. "Who will win?" Swimming (with hands) breaststroke and crawl on the chest.
5. "Relay". The game involves two teams. Players can sail by any means. If they have mastered all sports swimming methods, it is possible to carry out combined relay races, where participants swim in different ways using their feet.
6. "Who is faster?". The players swim in pairs with the board using leg movements. In this case, the partner lies on his back in front of the floating and holds his hands on the board. You can swim crawl or breaststroke.
7. "Relay Relocation". Swimming is allowed in any way. At the command of the coach, the participants swim to the opposite side of the pool. The last one to sail is eliminated from the game. The relay can be carried out with stops. After each swim, the players are given a short rest.
8. "Salki with the ball." Players randomly move throughout the pool area. One of them - "salka" - swims with a light ball, trying to get them into any of the players. A player who is hit by a ball becomes a "stick".
9. "Water polo." The game involves two teams. The first occupies the field line on one side of the pool, the second on the other. Each team has a back gate. The coach throws the ball into the middle of the field. Players swim towards the center, trying to get hold of

the ball and throw it at enemy gates. The team that scores the most goals at the opponent's goal wins. It is not allowed to drown each other and hold the ball in their hands for a long time.

10. "Leapfrog". The players stand in a column one at a distance of 2 m from each other and lean forward. The player standing last jumps over everyone standing in front.
11. "Who will pull?" Two players, grabbing each other with their legs, row what force they have with their hands, trying to drag a partner along with them.
12. The Flying Dolphin. Standing at the bottom, the players jump out of the water up - forward and, throwing their hands forward, enter the water again. At the same time, they try to straighten the body and slide forward under water.

MORE ABOUT GROWTH AND NUTRITION

One of the most important prerequisites for enhanced growth and development of the body is a properly organized, rational diet. But what does rational mean and how to organize it correctly? How to make food only benefit and not harm? To answer these questions, it is necessary, first of all, to get acquainted with the basic functions of nutrition and their effect on a growing organism. The use of such knowledge in everyday practice allows one to avoid mistakes in food rations and create a menu taking into account the quantity and quality of food necessary for each individual person. And this just creates the conditions for food with maximum benefit. So let's move on to considering the nutrition functions. The ancient Greek philosopher Socrates also owns the saying: "We do not live in order to eat, but eat, in order to live." For many millennia, people have tried to feed themselves in order to survive in a deadly battle: .i existence.

The science of nutrition has its roots far back centuries. Some important provisions and recommendations on rational nutrition are contained in the rich experience accumulated by different peoples over many millennia, in the works of Hippocrates, Galen, Avicenna and other scholars. Then the idea was formulated that nutrients are, in fact, therapeutic agents. For a long time, they were of the opinion that eating means “filling up” the body with a portion of “fuel”, and it does not matter how much and in what quantity, if only the flame of metabolic processes would glow brightly and give energy for human life. Therefore, it was believed: the more you eat, the more good. Subsequently, it turned out - with excess nutrition, the body seems to suffocate from the abundance of nutrients and calories and accumulates them in the form of fat. Enhanced fat formation is that kind of outlet with which the body gets rid of excessive "fuel". These truths have long been known, but not all have drawn conclusions from them. Which of us is not familiar with the desire to cram into your child as much as possible the most high-calorie foods? "For mom, dad, grandmother, grandfather ...". And if at this time the child is overfeeding, which is quite possible, then fat cells are immediately funded in his body, which later will serve as the basis for the appearance of excess body weight and obesity. Currently, scientists, led by Academician A.A. Pokrovsky, on the basis of deep scientific research, developed recommendations for a rational, balanced diet. Their essence boils down to the following. For normal functioning of the body, it is necessary to provide it not only with energy and “plastic” (building) material, but also with other components of food. The exclusion of at least one of them can disrupt the complex course of the entire digestion process

1) MSN of substances and energy - the main function of the body is 1.1 people. It is a constant waste of energy and matter. Even when we sleep, the brain, internal organs work, and some muscles are stressed. All material and energy costs are reimbursed by food. The daily diet should completely cover the energy expenditures of the body over the same period of time. Any persistent imbalance in energy balance affects growth. With an energy deficit, a shortage arises for the successful course of growth processes. When there is too much energy, excess fat inhibits the work of the endocrine glands and metabolism, which also leads to inhibition of growth. Thus, the first requirement for a properly organized diet is energy balance, which is judged by the relative stability of weight and its change with age, proportional to the increase in body length. This condition is one of the prerequisites for the full implementation of the hereditary growth program. How can you determine the presence of obesity? If obesity is severe, then it is noticeable to the eye. At the initial stage, more precise criteria are needed. To determine the harmonious development of a person, it is necessary to know the weight that he must have with normal growth. This can be done in many ways. One of them is the division of indices. They are offered by many authors. I, when calculating the Brock-Brugsch index, use the following formulas: $H - 100$ for $b = 155-165$ cm; $H - 105$ for $b = 166-175$ cm; $H - 110$ for $b = 176$ and more cm. I. G. R offers a different formula: $I = 55 + \frac{4}{5} (L - 150)$. The notation is the same. The Kettle weight-growth index is obtained by dividing the weight in grams by the height in centimeters. On average, it is equal for young men - 370-400 g, for girls - 325-375 g per 1 cm of growth. There are other indexes.

Knowing how much weight a person should have, it is not difficult to identify the presence and degree of obesity. At the least, I degree of obesity, body weight exceeds due by 15-25%, with II degree - by 26-50%, with III - by 51-100% and with IV - over 100%. Already III degree of obesity is considered a serious disease. The second nutritional requirement is the quality of the food. The body is not indifferent to what it will be built from. Nutrition brings maximum benefit only if it contains well-defined nutrients, moreover, in fairly strict proportions that correspond to both energy and plastic functions. By chemical composition, any food can be divided into 4 main components: proteins, fats, carbohydrates and mineral salts present in it in different proportions. Each food component has a wide range of functions that determine its role in metabolic and plastic processes, and, consequently, physiological significance.

Squirrels. The body needs proteins in order to build new muscle cells, replacing the old "worn out" ones. Proteins support and, if necessary, "repair" the cells of muscles, nerves, blood, skin, heart, brain. They are also part of the hormones that control the biochemistry of growth, development and metabolism. There are millions of different proteins in every body, but they are all built from various combinations of just 20 amino acids - simple organic molecules.

Proteins are synthesized in cells. Protein formation requires the presence of, as a rule, all 20 amino acids. If there are enough of them in the body, then all proteins in the right quantities are synthesized. If some amino acids are missing, it inhibits the formation of proteins and, accordingly, the renewal and growth of cells, organs of tissues, the whole organism. However, the lack of certain amino acids has a different effect on protein synthesis and, in particular, on growth processes. This is due to the fact that part of the amino acids can be synthesized in the body itself (therefore they are called interchangeable). But there are amino acids that cannot be synthesized in the body (they are called indispensable), but come into it only with food. This is

the key to understanding the problem of protein nutrition. Long-term protein deficiency contributes to the development of the so-called food dystrophy, which is accompanied by emaciation, memory impairment, attention, ingenuity, stunting. To maintain normal protein balance, scientists recommend that at the age of 1-3 years, consume about 4 grams of protein per day per 1 kg of body weight, at 8-10 years, 3 grams, for children over 11 years old, 2.5-2 grams, for adults - 1 -1.5 grams. The most rich in high-grade proteins are animal products: eggs, meat, fish, milk, dairy products. Their biological value is determined by the fact that in amino acid composition they are close to the composition of human proteins, and therefore are absorbed by 80-90%. So, according to a major expert in the field of nutrition, Professor K.S. Petrovsky, "meat proteins are characterized by a high content of amino acids with growth properties." Currently, it has been proven that when taking protein food, the secretion of the main growth hormone - somatotropin, as well as some other hormones that provide growth processes is enhanced. In this regard, the question arises: does it mean that in order to grow up, you need to eat as much meat as possible? Is it so? It turns out no.

With excessive consumption of meat, we introduce into the body many purine bases, extractive substances that cause intestinal rot and poison the body. It was found that plentiful meat food suppresses the activity of beneficial intestinal microflora. Meat food is known to abound in toxic metabolic products that are appropriate for release from the body. This was known in the countries of the Ancient East. There even existed a kind of execution: those sentenced to death were fed only boiled meat, and they died from self-poisoning on the 28-30th day, i.e. much earlier than with complete starvation. But if people who use meat in writing would decide to do without it, then where would they get the necessary protein from? In this regard, more and more attention is now being paid to oilseeds. They contain proteins that are closest to the composition of animal proteins (i.e., proteins of animal origin) and in addition in large quantities - up to 30%. For example, the widespread use of protein extracted from soybean seeds is known. Now in our country the industrial use of sunflower proteins is being mastered. A valuable source of complete proteins are nuts. In ancient times, walnuts were called the food of the gods, and cedar was called the king of the taiga, the pearl of Siberia. Fats. Although too much fat makes a person obese, nevertheless, the daily diet must necessarily contain a certain amount of fat in order to ensure the full functioning of the body. First of all, the heart needs them. A decrease in the fat content (less than 20% of the total calories) in the daily diet can lead to serious health complications and, possibly, even a disturbance in the rhythmic functioning of the heart.

Fats participate in the construction of hormones and other active substances. If there is a lack of industrial nutrition, cell division is delayed, the growth of the body is hindered, its development is impaired. Fats can be of animal and plant origin. The first are contained in large quantities in

"whether night oil, sour cream, fatty meat, fat, caviar; juicy - in nuts, olives, sunflower seeds, cotton, corn,. What should be the optimal amount of fat in food and their ratio? It depends on what age of the person. Children up to 3 l It takes about 50 grams of heat per day, 10% of which is vegetable. 1 <7–10 years old should receive about 80 grams of i and ditch, of which vegetable make up already 20%. And Ilyos need almost as much fat (80-100 d), but the proportion of vegetable with age increases to 30%. Carbohydrates. This is a large group of organic compounds, which are mainly found in products of plant origin, making up the main i.c. of their nutrients. Complex carbohydrates are found in vegetables, fruits, grains, nuts and all grains, their crops, are the most important source of energy for the body. In fact, they - I - C', are the only "fuel" on which nerve and brain cells are wrecked. The body needs carbohydrates in order to use other sources of energy, for example, live and also create certain amino acids that it can produce on its own. The main carbohydrate in the human body is glucose. Only it can be used for the study of energy. In order to use any i i oh carbohydrate as an energy source, first with intestinal enzymes it must be pre-ii 'and prices and simple sugars, and then the liver turns. Pi * ikhara into glucose

However, excessive consumption of carbohydrates is fraught for a growing organism with at least two serious complications. The first is due to the fact that an excess of carbohydrates turns into fat, which is deposited in the tissues under the skin, in the heart, blood vessels, liver, kidneys, muscles, and obesity develops. The second complication - carbohydrates, in particular glucose, directly inhibit the secretion of growth hormone. The more sweets you eat, the less you grow. This must be known to all the sweet tooth! It is not recommended to use sugar, white flour, rice and other products that have undergone significant processing for food, because they, by themselves, do not give the body any nutrients and even deprive it of a certain amount of vitamins. The digestive organs need B vitamins in order to break down and use carbohydrates. A number of food products contain vitamin B, but those that are well refined do not have it, and therefore they use the vitamin already contained in the body, thus forming a deficiency of vitamins of this group. After a hard workout, I want to eat both sugar and heavy writing, which contains starch and B vitamins, because significant amounts of carbohydrates were used up. Well, please. Eat wholemeal bread, potatoes, and fresh fruits. All this will not give weight gain, it is only necessary to simultaneously reduce the intake of proteins and fats in appropriate proportions. The gain in weight will be given not by a slice of white bread, but by the butter and jam with which it is spread. With a balanced energy diet, the optimal ratios in the daily diet of proteins, fats and carbohydrates are recommended (tentatively): for young children - 1: 1: 3; for older children - 1: 1: 4; for youth and adults - 1: 3: 5.

Mineral salts

They are important for chemical reactions that help the muscles work, transmitting nerves to the brain's impulses and vice versa, controlling the frequency of 1 radical contractions, regulating the amount of water in the ryanism and its location. They participate in the bone formation (salts of calcium and phosphorus), promote the growth of teeth, hair and nails. There are a lot of them in cheese, cheese, and other dairy products. God's calcium - cabbage, phosphorus - meat, fish, legumes,

1

1 shovel bread.

Vitamins

biologically active substances that are unreachable for the correct course of many metabolic processes, as well as the regulation of physiological and biological and quick reactions. To grow successfully, you need all, more than 20 of the present. vitamins, and moreover in a night amount. Directly on growth affects about a third. Especially important of them are vitamins A and D. Vitamin A affects both the growth rate of i.o. <gay and the work of the endocrine glands, especially the foreign body, function which provides growth processes. Vitamin D, regulating f calcium and calcium phosphate, also stimulates growth, contributing to normal development and ossification of the skeleton. Vitamin A we: carrots, red peppers, fish and beef feathers., butter, caviar. Vitamin D rich: fish varieties, egg yolks, butter, sour cream, cream 11 and other vitamins should be noted E, C, P, and B. Ilmin promotes the accumulation of vitamins and D in the tissues. Vitamin E helps keep cells and necks intact, which allows the body to grow orally. The body needs this vitamin in and. small quantities. It is well-balanced and i nieta, including nuts, wheat flour, salad, niinat, peas, soy, margarine, vegetable oils, and

the body needs the amount of this vitamin. Vitamin C significantly increases the body's ability to absorb iron, a complex of vitamins B and vitamins A, E. It stimulates the immune system, and thus, the body develops a higher resistance to infectious and other diseases, stimulates the metabolism, improves the use of using of protein supplied with food. All this has a positive effect on human growth and development. A well-known source of vitamin C is orange juice, but there are also richer foods, such as various varieties of cabbage, lemons, grapefruits, black currants, rose hips and strawberries. The value of vitamin P is determined primarily by the fact that it acts together with vitamin C and significantly enhances its effect. A significant amount of this vitamin is found in fresh herbs, cherries, lingonberries, aronia. B vitamins regulate the functioning of the central and peripheral nervous systems and are involved in carbohydrate metabolism. The more energy a muscle cell produces, the faster B vitamins are consumed. Therefore, the more active your lifestyle and the more carbohydrates you absorb, the more B vitamins you need. The higher the deficiency of group B vitamin in food, the more likely that this food will not go to the growth of the body, but will be deposited in the form of fat. Natural sources of these vitamins are liver, yeast, peanuts, legumes, wholemeal products, oatmeal, sunflower seeds. How many of these products should be consumed to provide the daily requirement of a growing organism for vitamins? The amount of vitamins and minerals that the body needs daily depends on height, weight, age and gender, health status, smoking, diet, genetic characteristics and how active you are.

(Given all these factors, no one is able to nurse exactly the required amount of vitamins and minerals for any person for each and every one. For normal life, about 40 different food components are needed daily.

I most people don't stick perfectly. Intensive diet. In those cases when the body does not receive all 40 necessary components in the correct ratio, the largest specialist in nutrition, Professor V.P. Spirichev advises, in addition to the variety of menus, to take from October to June one of the multivitamin preparations (Undevit, Hexavit, Decamevit, Revit) in a daily dose corresponding to the age of the recipient. In his opinion, this will be the most important means of preventing hypovitaminosis.

MASSAGE AND SELF-MASSAGE

In the system of agents that increase growth, massage should be noted. Massage is a great wellness supplement to exercise. Skillfully done, it gives strength, strengthens the muscles, rejuvenates the sus and you, improves metabolism. The history of massage goes back centuries.

- poets and pagels of antiquity left a description of many massage techniques that were used as therapeutic. In Egypt, Libya as early as 12 centuries BC primitive forms of massage were known (rubbing and tumbling). The preserved ancient monuments of Egypt <indicate that kneading and stroking were used after swimming in the pools. In ancient China, there were medical and gymnastic schools, where patients from all over the empire arrived for massage treatment. On numerous Greek vases, frescoes that have survived to this day, there are images of massage techniques, rubbing the body with oils, incense. IN

Ancient Greece, massage was considered the most important means of maintaining and restoring performance. C. Galen (131-201 CE), the chief physician of the Roman school of gladiators, described nine types of massage, dwelling in detail on the technique of stroking, rubbing and kneading. In the famous work of Avicenna, "The Canon of Medicine," instructions are given on the use of massage techniques in the treatment of a number of diseases. He distinguished the following types of massage: strong - strengthening the body; weak - softening, relaxing the body; long - contributing to the weight loss of a person; moderate - contributing to the "prosperity of the body"; preparatory - prior to physical exercise; recovery - after exercise. The works of Avicenna contributed to the development of massage in Turkey, Persia and other countries of the East, where massage was widely used in public baths. A.S. Pushkin wrote in A Journey to Arzum: "Gassan began by spreading me on a warm floor, after which he began to break my limbs, stretch my joints, and beat me with a fist; I didn't feel the slightest pain, but an amazing relief (Asian bath attendants are sometimes delighted, jump on your shoulders, slide their legs on your hips and dance squatting on your back ...)" There were many different methods of treatment, healing and improving the body of different nations. In Russia, for example, since ancient times there have been chiropractors, who successfully coped with various diseases and injuries of the musculoskeletal system. muscle, every bone. Unfortunately, in most cases, we forgot the centuries-old experience of our ancestors. Modern methods of treatment, which are far from harmless to the body, have almost replaced traditional medicine.

Nowadays, traditional medicine methods have begun to revive gradually. It is they that make it possible, without harming a person, activating the body's own defenses, to prevent and cure many ailments. Massaging is primarily an effect on nerve receptors located in the skin, muscles, tissues and associated with the central and autonomic nervous systems. In sensitive ways, impulses, delivered by massage techniques, are transmitted to the central nervous system and reach the corresponding sections of the cortex of the cerebral hemispheres, where they are synthesized into a complex reaction, causing various functional changes in the body (muscle, heart, lungs, other organs) In addition to the neural factor, the mechanical effect of massage on human organs plays an important role, as a result of which the circulation of lymph and fluids is enhanced, obsolete epidermal cells are removed, stagnation is eliminated, metabolism and skin respiration are strengthened, which, in the end result, also contributes to the active growth of the body . Thus, the benefits of massage for health and growth are obvious. Massage can be general or partial; With a general massage, the entire body is massaged from head to toe. Duration of the session is 20-25 minutes: 8 minutes massage the lower limbs (4 minutes each), 6 minutes - the upper (3 minutes each), 6 minutes - the trunk (3 minutes on the muscles of the chest and abdomen, 3 minutes on the muscles of the buttocks) With a partial massage, a certain part of the body is massaged, which takes 2-12 minutes. The greatest effect of massage is achieved with complete relaxation of all parts of the massaged. All massage methods are performed along the lymphatic paths (ie, to the heart), in the direction of the closest lymph nodes.

Lymphatic ulcers in the popliteal fossa, armpit and groin cannot be massaged. The position of the person being massaged should exclude tension in the muscles and joints and allow maximum relaxation of the whole body. Massage techniques should not cause pain. Massage techniques are so diverse and subtle in their tactics that they allow differentially acting on individual parts of the body and on various tissues: muscles, subcutaneous tissue, skin, joints, etc. To conduct a massage, you need to know the following techniques and the procedure for their implementation (according to A.A. Biryukov): 1) stroking; 2) squeezing; 3) kneading; 4) shaking; 5) grinding; 6) movement; 7) shock techniques; 8) shaking (at the end of the session). Each of these techniques has its own specific, mechanical and physiological effect on the body and is applied strictly to certain tissues. Receptions have their own varieties, with the help of which general and particular problems are solved.

Stroking. Its physiological effect and methodology

Stroking is the most common technique, since its physiological effect is very diverse. Under the influence of stroking, the local temperature rises, there is a pleasant sensation of warmth, vasodilation occurs, which causes a rush of arterial blood to the massed area and, in turn, promotes redistribution of blood in the body. The action of stroking affects the skin with which the obsolete epidermis flakes are removed - skin respiration improves. When stroking, the excitability of the nervous system is removed. In most cases, stroking is performed with the palm of a relaxed hand. Four fingers should be closed, and the large one is taken to the limit so that the brush most widely encompasses the massed area. And now get acquainted with the types of stroking and technique of execution.

1. Stroking straightforward. The masseur stands perpendicularly (conventionally accept the axis of the shoulders as a reference point) to the massaged area. The brush is set across

the muscle and strokes forward.

2. Stroking zigzag. The brush is installed on the diagonal of the massaged area and slides zigzag.
3. Combined stroking. Consists of a rectilinear and zigzag. One hand slides in forward and the other in reverse.
4. Stroking concentrated. It is used only in the joints. The brushes are superimposed on the knee joint and gastrocnemius muscle (touching each other), then in the transverse direction they move to the thigh with significant pressure on the side sections of the knee joint. In the starting position, i.e. on the calf muscle, return easily.
5. Stroking with two hands. The masseur is standing on the side, the brushes advance forward in turn.

Squeezing and Technique

Squeezing is a widespread practice that came to us from Finnish massage. Squeezing is done energetically, therefore, it affects not only superficial tissues, but also deep ones. The reception has several varieties.

1. Transverse squeezing. Masseur stands perpendicular to the massaged. The thumb is taken to the index, the brush is set across the massaged area and moves forward with considerable pressure. Squeezing produces- <h thumb and its tubercle.
2. Squeezing the edge of the palm. The brush is set across the massaged area with the palm forward. Squeezing with one hand. The brush is set along the massaged area, the thumb is pressed to the index finger (forms a tubercle on the palm side), the remaining fingers are slightly retracted towards the little finger and relaxed. The squeezing movement is made by the thumb tuber and the base of the palm. The action can be strengthened by weighting with the

other hand.

Kneading and its physiological effects

Kneading is the main technique by which muscles are massaged. Improves blood supply not only to the massaged area, but also to nearby ones. It activates redox processes, is like passive gymnastics for muscles and blood vessels. It stimulates the receptors of muscle tissue, tendons, ligaments, joint bags, fascia and periosteum, thereby changing the state of the central nervous system and peripheral neuromuscular system. There are several varieties of kneading. 1.

Ordinary kneading. Consists of two points. In the beginning, with straight fingers, you need to tightly grasp the muscle across so that there is no clearance between the palm and the massaged area, and bringing the fingers together (the big one tends to four, and four to the big one), lift the muscle and make a rotational movement towards four fingers to failure. Then, without expanding the fingers (the muscle is not released from the brush), return the brush with the muscle to its original position. At the end of this movement, the fingers slightly release the muscle, but the palm remains firmly pressed to it; the brush moves 2-3 centimeters forward, captures another area and repeats the first cycle. Reception is carried out rhythmically, without jerking. 2. Double neck. It is carried out in the same way as ordinary kneading, but one hand burdens the other (overlay fingers by four, and large by large). An energetic, deeply acting technique. It is applied on large and highly developed muscles.

3. Double ring kneading. The most important trick. The brushes are installed across the massaged area at a distance of 7-10 centimeters from one another so that the thumbs are on the outside and the rest are on the inside. Grasp the muscle tightly with both hands, pull it from above, squeezing and moving it with one hand away from you, and the other

towards you. There is a characteristic interweaving of upward muscle mass (resembling a zigzag in the horizontal position), which should not slip out of the hands of a massage therapist throughout the entire massaged body part.

4. Double ordinary kneading is performed similarly to ordinary kneading. The foot of the massaged one lies on the thigh of the masseur, the knee is laid out. A masseur puts his hands on the thigh just above the knee so that one hand is on the back of the thigh and the other on the front. All thigh muscles are massaged immediately.
5. Longitudinal kneading. The masseur puts both hands on the muscle longitudinally, alternately with one, then with the other, kneading.
6. Kneading with one hand. The brush is superimposed longitudinally, the reception is performed by the thumb pad. It is most often used on flat muscles with the aim of local action.
7. Kneading with the base of the palm can be carried out with either one hand or two. It is performed from a position perpendicularly and longitudinally with respect to the massaged one. The muscle is pressed and shifted towards the little finger.
8. Kneading with the phalanges of the fingers. Four fingers (clenched into a fist, with the middle phalanges, the muscles are pressed and shifted towards the little finger. The effect can be enhanced by the pressure of the other hand.
9. Kneading with fists, forearm (elbow) is carried out on strong and large muscles. Most often used in the shower and bath using soap

Shaking

It is applied after kneading in combination with squeezing. It promotes a better outflow of blood and lymph, evenly distributes interstitial fluid, has a calming effect on the central nervous system and a relaxing effect on muscles. Shaking is performed with the little finger and thumb, the rest are slightly raised. The frequency of shaking movements is approximately 12-15 in 2 seconds.

Trituration

It is used mainly on joints, tendons, ligaments, with loads of the ligamentous-articular apparatus, in areas of poorly irrigated blood, and where there are congestion, as well as injuries and microtraumas, when swelling and hardening occurs in the joints. Rubbing techniques are carried out with the pads of all fingers or one, two, etc., with the base of the palm, with crests of fingers clenched into a fist (depending on the massaged area and the target). They can be rectilinear, zigzag, spiral, circular, dotted. They are performed with one hand or two, as well as with weights.

Movement

They are carried out after deep kneading and thorough grinding. They improve the secretion of synovial fluid in the joints, as well as blood and lymph circulation in the joints and closely located muscles. They give a good effect in preparing joints and muscles for exertion, in preventing injuries, recovering from heavy exertion, and also in treating the consequences of sports injuries. There are several varieties of movements.

1. Active movements are performed by the person massaged by the masseur's command (after appropriate muscle massage and joints). This right determines the degree of

mobility - the amplitude of the joints and then proceed to passive movements.

2. Passive movements are performed with the help of a masseur with tight mobility in the joints, as well as with contractures in order to increase mobility.
3. Movement with resistance can be performed with the resistance of the massage therapist or massage therapist with the resistance of the massaged. In this case, you can dose the load, exercise the muscles and individual ligaments and tendons.

Shock techniques

They are carried out most often on large muscle groups (back, pelvic region, thigh, chest, calf muscles), which should be extremely relaxed. They cause contraction of muscle fibers, which spreads along the entire length of the muscle, due to which blood flow increases, and tone increases. The central nervous system is exciting. There are several varieties of percussion techniques.

1. Basting is carried out with fists (slightly bent fingers), the blow is applied from the little finger. The brush should be relaxed, the little finger is slightly retracted.
2. Patting is performed with a relaxed brush, which takes the form of a box, the bottom of which is the palm. In this case, the fingers are bent and facing the massaged area. The blow is applied by the phalanges of all fingers, slightly clenched into a fist.
3. Hacking is carried out along the muscle. Fingers apart, straightened and relaxed with the little finger, the other fingers are closed at the same time, and behind are again divorced.

Shaking

The physiological effect is similar to shaking. It is carried out after all receptions at the end of the session. It is used when it is necessary to relieve tension from the legs and arms, increase blood circulation in the limbs or quickly refresh (restore) the muscles. Massaged on his back, the massage therapist takes his leg by the ankle joint, raises it at an angle of 35-55 degrees and makes shaking movements in the vertical direction. Apply this technique in the form of self-massage. When studying massage techniques, try to learn how to perform each of them with one and the other hand. This is useful to you when massaging yourself, you have to process various parts of the body. Self-massage is practically no different from massage. He is only a little tiring. Therefore, using it, you can reduce the time of sessions. True, the movements that you will need to perform during self-massage will only benefit. In conclusion, we can conclude that massage allows you to purposefully change the functional state of the body. Therefore, its use in combination with physical and other means will increase growth.

IF YOU WANT TO GROW UP - KEEP OUT!

One of the most important prerequisites for the successful growth and development of the body is hardening. It is an excellent preventative against various diseases and to promote health.

What is the reason for his miraculous power? What is its effect on growth?

■ / ‘^ It is known that the younger the body, the more vulnerable it is to external factors: heat, cold, excessive atmospheric pressure, dampness, solar radiation, and infection. This is due to insufficient development and training of defense mechanisms that are weak from birth. And if so, adverse factors can cause disturbances in the body and the development of diseases that lead to stunted growth. "The human body" - wrote I.P. Pavlov is a self-regulating system of the highest degree that corrects itself, restores and even improves itself. ” And one of the most

important types of self-regulation of the body is to maintain its constant internal temperature, regardless of various changes in the temperature of the environment. Temperature regulation is carried out by the central nervous system. Special nerve endings are located on the surface of the body - thermal and cold receptors (there are many more cold ones and they are very sensitive). From them, the signals enter the thermoregulation center located in the hypothalamus. Having received signals of a change in body temperature, he begins to direct the work of various organs. If the signals carry information about the action of the cold, then the hypothalamus sends commands for narrowing, causing the skeletal muscles to contract. As a result, heat production in the body increases and heat transfer decreases. Under the action of heat, the opposite happens. Hardening - increasing the body's resistance to adverse external influences - cold, heat, humidity and dryness, atmospheric phenomena - occurs as a result of the systematic training of its protective mechanisms. This happens in two ways. So, if you constantly live in a hot (or cold) climate, resistance to heat (or cold) increases, and this process is slow, complications. This is explained by the fact that the impact of a factor is random, its duration and effectiveness are not regulated. In this case, they talk about passive hardening. The second way is that the body is systematically exposed to the dosed effect of this factor. This is an active hardening. Hardening can be specific (resistance to a certain factor increases) and non-specific (overall resistance to a number of factors increases). Starting to harden, learn its basic rules. Rule one: you need to make sure of the need for hardening and bring up the need for it. Conscious attitude, interest will create the necessary psychological attitude and ensure success. Rule two: hardening should be systematic, and not from case to case. Even a two-week break significantly worsens the previously achieved effect. Rule Three: Follow the principle of gradualness. You can not sharply lower the temperature of water and air, as well as increase the

duration of the hardening procedure. Rule four: do not forget about the individual approach. Air or water temperature, the duration of the procedure are established taking into account the individual characteristics of a person: age, gender, state of health and level of physical development, sensitivity to cold or heat. Rule fifth: in each specific climatic region, hardening must be specific. It cannot be the same in Vladivostok and Tashkent, Moscow and Yalta. The rule of poles: to increase the effectiveness of hardening, use all means - sunlight, air and water. Rule seven: conduct hardening in a good mood so that it brings pleasure. Positive emotions completely eliminate the negative effects of cooling or the action of heat. And now from the general considerations we proceed to the selection of specific hardening procedures.

Sun bath

Popular wisdom says: "Where the sun looks, a doctor rarely goes there." Indeed, solar pannels have a beneficial effect on the body, especially the action of sunlight for the body during its growth. Solar radiation improves metabolism, increases the number of red blood cells and the content of hemoglobin in the blood, improves the composition of lymph, has a beneficial effect on the digestive system and pancreatic function, increases the general tone of the body, its resistance to infections. Sun rays are necessary for the synthesis of vitamin D in the body, without which bone growth and development, the normal activity of the nervous and muscle systems, some other functions, for example, A, C, E, are disturbed. This is especially important because the activity of the vitamin formed under the influence of sun rays is many times greater than the activity of its drug analogues. The best place to sunbathe is on the shores of natural waters, where the air is always clear and clean. The time of a solar procedure morning hours are favorable. We tentatively select the optimal time and sunbathing. They are different in different parts of the country: in the southern regions this period is from 7 to 11 and it, in the

middle lane - from 8 to 11, in the northern regions - from ■ to 12 hours. To adapt the body to salt rays, you should take an air bath (after Part II of II stumps) and only after that start to take • ideal baths.

How to dose their duration? You can be guided by the following rules: for practically healthy, physically well-developed people, the duration of the first sunbath should not exceed 5, the second - 10, the third - 15 minutes. Gradually adding 5 minutes, the duration of the procedure can be brought up to 30-40 minutes. People with poor health and hypersensitivity to the sun should be hardened in stages: 5 min. be in the sun, 5 min. - in the shadow. This is the whole period of the sunbath. Sun bathing is recommended to take 1.5 hours after eating. After sunbathing, it is useful to douche with cold water (+ 16-18 °) or swim in a pond, and then rub well with a towel. Failure to comply with these rules can cause disturbances in the body. In case of abuse of the sun's rays, burns appear, disorders of the central nervous system, headaches, loss of appetite, sleep disorders, a sharp decrease in performance. To normalize the state of health in this case, it takes a long time.

Air quenching

The safest and lightest tempering agent is the air around us. "We must not count the hours allotted for staying in the fresh air," wrote the Russian doctor V.N. Dmitriev, on the contrary, the hours spent in the rooms, and to consider them as wasted time, or even worse than that, as a time that brings evil instead of good. " They take air baths in nudity or in clothes that allow air to pass through. Initially, the duration of healthy air baths should not exceed 10-20 minutes. at a temperature $t_{\text{air}} = 15-20^{\circ}$. Then it needs to be increased (daily sludge 5 10 min.), Bringing to 2 hours. Further smoothly outwit. to lower temperature air baths. I v i> you need to start

hardening in the warm period of iodine, then by autumn the person will be sufficiently hardened, and to take cold baths. After an airy 1 1 1 1 iy it is recommended to take a warm shower. The best time to take air baths is the morning hours, when the air is saturated with ultraviolet vchdmi sun. You can not take baths on an empty stomach and once after a meal. The interval between meals and 1> a bath should be 1.5-2 hours. During the air procedure, one should not bring the 'bi to chills. To prevent it, you can do "• how many physical exercises or go for a run. In '• wet and windy weather, the duration of the air-" • i \ bath is reduced. Such hardening has a positive effect on the functions of all organs, increases the overall reaction and in the body post.

Water quenching

Noda - the most powerful and effective tempering- • H '»■ means widely used since ancient times • (), let that shameful shyness against the other's be exterminated; water, which I, unfortunately, had noticed with my fellow compatriots "- the famous Russian doctor M. Lamovsky was eager for such a fiery“ ** “•”. 11, and immersion in cold water in the body of people * '* <"A peculiar vascular reaction takes place: it's km and contract (the skin turns pale), and the blood rises to the internal organs from the first« | | r |> nn. Following •' and i H blood again sent from the internal * •! * ”“ * • <“. i“ i ik rifieria, the vessels of the skin expand, and the “•” ic.ier pleasant warmth. The narrowing and expansion of both | iirrii and i ,, Ich soszschov is a kind of their gymnastics, '■ r p ”feasts on the skin, makes it better when the temperature of the environment is better.

Water procedures reflexively affect the activity of all organs - the heart, lungs, brain tissue, and therefore the state of the nervous system, blood circulation and respiration. The temperature of

the water at the beginning of hardening should be such that a person can tolerate it calmly, without irritation; air temperature + 18-20 °. The best time of the year is spring and summer, and the day is morning. Water hardening is recommended to start with wiping and dousing. Wiping the body is carried out with a wet sponge or towel for 1-2 minutes, after which it is necessary to rub the body well, easily massage it and put it on. Dousing is a more intense type of hardening. First you need to carry it out with warm water, then with room temperature water, gradually bringing the duration to 2 minutes, and lowering the water temperature to + 15 °. Shower is the next step in water quenching. First, they take it with a water temperature of + 30-35 °, lowering it every day by 1-2 °, gradually increasing to 15 °. The duration of the procedure is 1-2 minutes. Swimming in open ponds and pools is one of the most common methods of hardening. It is recommended to start it in the spring at a water temperature of + 15-17 °. The first stay in water should not exceed 12-20 s. Gradually, swimming is increasing. Especially useful is the combination of water procedures with movement (swimming, water gymnastics). An excellent means of hardening is also swimming in sea water. When swimming in the sea, the human body is affected not only by temperature and mechanical factors (the movement of the waves, the swimmer himself), but also by chemical factors - the effect of salts dissolved in water. You can start swimming at air temperature of at least + 20 ° and water - + 17-18 °. The swimming season is completed when the air temperature drops to + 15 °, and the water drops to + 12-14 °.

Speaking about bathing, it is necessary to make one remark. It refers to the widespread recommendation that bathing and other tempering procedures after bathing and other tempering procedures are necessary to rub the skin until reddening, with a view to preventing cooling. It is

known that after i.n. weaving, the skin turns red and a pleasant sensation of warmth arises. This occurs as a result of a rush of croma from the internal parts of the body to the subcutaneous and skin - w ud. There is danger in this. Being an artificial technique of changing blood circulation in the body, i.i.nimation wears it off independently - i.n i. cooling, "recognizes" to wait for outside help. Research by Professor A.K. Podshibyakina and Ipiks showed that rubbing slows down the formation and physiological mechanisms of thermoregulation, which, in turn, makes it difficult to fund the hardening effect. This, of course, does not mean a complete third refusal from rubbing - during hypothermia, it is shredded and necessary. Rubbing is also shown for people who are weakened, with a weakly expressed reaction to cooling. Walking barefoot also applies to hardening methods, • which is also an excellent means of PR "III flat feet.! I and taking soil for walking barefoot, it is necessary to take into account its different types (in temperature and temperature). ig_p to someone irritation) act on the body pore i "M \. Hot sand or asphalt, snow, ice, sharp • impk slag, coniferous needles or cones excite the system. Soft grass, sand, road dust, ■ um and the carpet are soothing. P. n / a from each barefoot walk, it is necessary to thoroughly wash your feet with water at room temperature with a 2–2 minute massage (warming up the toes of the soles with subsequent stroking on the foot and to • the knees). M 'i recommend the following lesson plan for i i i.n.iiiio walking barefoot.

April: walking around the room in socks (30-60 s), two weeks later walking on the carpet barefoot (30-60 s); foot baths 2 times a day with a gradual decrease in water temperature from + 30 ° to + 20 °. May: walking barefoot on the floor (1.5-2 hours); short run-out barefoot on heated asphalt, grass, ground; foot baths with a gradual decrease in temperature from + 20 ° to + 8 °. June-July: constant barefoot walking around the house, cold foot baths at a water

temperature of + 8-10 °; walking along the edge of the pond and sea sand and walking barefoot on grass, sand, uneven ground, pebbles (30-50 min.); barefoot running (1-5 min.). August-September: all activities, as in previous months, as well as walking and running on wet asphalt. October-November: all activities, as in previous months, increasing the duration of barefoot running. December-January: the same, as well as contrast baths using snow water, rubbing feet with snow. February-March: all events as in previous months, partially performing barefoot exercises in the fresh air. Finishing the chapter, I want to say that when organizing the hardening, the ancient medical commandment should be followed: "First of all, do no harm."

HOW TO CORRECTLY SLEEP

Proper, sound and healthy sleep is one of the key conditions for increasing growth. Indeed, in a dream a person grows. It is during deep sleep that the body most actively produces growth hormone. The hormone that makes you taller and stronger lengthens and thickens your bones. Actually, the rules of healthy sleep will be discussed below. How to sleep? Tips for those who want to increase growth. 1) You need to sleep in a room where it is dark, quiet and fresh. Most of us live in megacities where high noise level, where it is light even at night and the air cannot be called adjacent. We are used to all of this, but it still affects sleep anyway. Therefore, ear plugs, a hood and curtains made of thick fabric are the first things you need to have for a sound sleep. 2) The sleeping room should be well ventilated - and. If there is no air conditioning - open the window. Do not be afraid to open the window even in winter. It is better to cover with additional woolen blankets than to breathe with stale air. 3) A hard bed will provide comfort to my spine. Too soft bed, on the contrary, will not allow you to fully sleep. If your blood is too soft, you can put a few fox plywood under the mattress. 4) Do not sleep on large pillows. Scientists generally advise sleeping without a pillow. Since in this. moreover, there is no

circulatory disturbance, they spin the brain, and improved cerebral circulation normalizes intracranial pressure. To increase growth and sleep, it is better to sleep on your back, with the flow x * under your head, and under your bent knees. It's not easy to get used to such a situation, but the benefits of it are "ICGIM and more glia. Iii But on the chip underwear and sheets should be beautiful and ii. p.imi. Therefore, make sure that the bedding AGAM * I makes you sick. A sound, healthy sleep and a gray-and-white look for incompatible concepts, the situation scattered by Nii and also of May. "* I l i.iraysya not to curl up" in a ball "during" mi n ", push your knees to your chest and elbows to your knees, which should be able to inflow air into the lungs. You need to sleep 0 nude to them and straightforwardly. Stretched out. .1 M <r tc, however, scientists say that an adult who has M-II KI pi i TI-eight hours of sleep is enough. However, iiii1 1 1 py for people of five, only five hours of sleep in su-1 mi and i | - like others need ten hours sleep During growth or adolescence, the body requires more sleep. This can be illustrated as follows: At 1-10 years, it is enough to sleep 10-15 hours; At 11-15 years, it is enough to sleep 9-11 hours; At 16-25 years old it is enough to sleep 9-10 hours. I repeat that we are all different. And enough ^ the amount of sleep is different for everyone. 8) Drink a large glass of water before going to bed when you wake up, this will help clear the stomach. Warm milk will help you fall asleep faster. Important: before bedtime, I write heavy, smoked, fried, sweet, etc., and also drink coffee, strong tea, highly carbonated drinks, etc. not allowed! After <\ e such a meal, a person's sleep will definitely not be healthy. 9) For better falling asleep, you need to set ■ a fixed hour of going to bed. Time, in order to wash, calm down, forget about all the problem ^ and tune in to rest. To calm down and calm down, complete the following task: Relaxation and breathing. Close your eyes and relax. Make sure that every part of your body is completely relaxed. From head to toe. Now a small breathing

exercise: Inhale slowly and deeply through the nose (10 s); Hold your breath (3 s); Exhale slowly and completely through the mouth while tightening the abdominal muscle (13 s). Repeat if necessary. The sound of pulsation of the superficial temporal artery also helps to relax and go into sleep. To do this, feel for her forefinger and c]; with the rare fingers on the cheek near the ear. Start counting your pulds. Such a method is much more effective than counting in the mind .. 10) In conclusion, I would advise you to adhere to the thought that Aristotle said a long time ago: "Who goes to bed early and gets up early will be healthy, more fat and wise. " Shaulin monks, for example, who are distinguished by their health and strength, follow a strict schedule: 21.00 - go to bed, 7.00 - rise. Not a minute later. They found that during this period the body is fully restored. I will summarize everything written above. In a dream, human growth increases. If this dream is healthy and strong. Try to sleep properly and get enough sleep, and everything will be fine. Good luck to you!

ONCE AGAIN ABOUT STRESS

The emotional sphere of human activity is one of the secrets of nature. All the negative effects of the environment affect the body in a complex, but nevertheless, the main reason for the "diseases of civilization" is various emotional shifts that arise as a result of nervous stress and prolonged stress. They are able to disrupt not only the mental sphere of human activity, but also the robot of its internal organs. What is stress? How can it affect I and g? The creator of the stress theory, Hans Selye, defined "i> that concept:" On the effects of various kinds - cold, V i i \ "and n>, blood loss, humiliation, pain and much more. type of impact, but also by some general homogeneous fm ii "ihmic process, regardless of whether the cue_m and the cinema stimulus acts on it in this urine-ni The organism through this process as if it's a young man adapt and not to a new situation, to adapt to it. "11 <emotional stress is accompanied by p

Azla-: illh in the work of the highest center of autonomic regulation - and i to the pads of musa, which is in charge of such important functions of the body as blood circulation, food and erm to regulate, the constancy of the internal environment, rchkoiodip hypothalamus and the work of the internal glands secretions, in the activity of which, under the influence of stress, there is a mismatch. Some glands begin to release too many hormones into the blood, others - too little, and others, unable to withstand the stress, are generally exhausted. All this is not indifferent to growth, which, as we know, is very sensitive to fluctuations in the internal economy of the body. Scientists have also found that the basis of the response to stress is the secretion by the adrenal glands of special hormones - adrenaline and norepinephrine. You have an unreasonably bad mood, a feeling of depression - this is due to an excess of adrenaline in the body. Your friend behaves for some reason hostile, irritable, aggressive, uttered a lot of insolence. The reason for this is an increased amount of norepinephrine. It is known that Julius Caesar chose those warriors who blushed, but did not turn pale, under sudden stress. It turns out that with the reaction of fear in the body, adrenaline is secreted. This causes vasoconstriction and pallor. With a reaction of anger, norepinephrine. The vessels expand, and the person turns red. A particular reaction to a stressful effect is manifested depending on the nature of the person. However, episodic stresses, as a rule, still do not affect growth, and if they are stopped in time, the child can grow and develop normally, managing to recover between the next "shakes". It is another matter if stresses continuously follow one after another. Then, under the influence of the above and some other changes in the body, the child has a constant feeling of internal tension, anxiety. Sometimes he cannot be freed from an oppressive state, becomes irritable or withdrawn, his sleep, appetite is disturbed, his mood worsens, and his working capacity drops. Doctors ascertain neurosis - this is already very serious. "Among the influences

that shorten life, fear, sadness, despondency, melancholy, cowardice, envy, and hatred take precedence,” wrote one of the founders of gerontology Kh.V. in the 13th century. Gufeland. This truth has remained unchanged and Today. With prolonged disorganization of the central nervous system, under the influence of negative phenomena and ■ profound changes in the autonomic and endocrine spheres, internal organs and, in particular, endocrine glands are involved in the pathological process. In this case, we are already talking about common therapeutic diseases, which are more and more often referred to as the so-called “psychology” - “KVM”, thereby emphasizing that they are based on the written mechanism of stress and neurosis. These diseases include bronchial asthma and diabetes mellitus "••] obesity, dermatoses and stomach ulcers. Naturally, serious disorders in the body do not bypass the path and growth, often becoming the reason for its persistence. How to be? How to protect your nervous system? V The best prevention of neurotic conditions is not v, sweating the correct organization of labor, active from .11 physical exercises, auto-training, tempering ii 'procedures. 1 i l l nm of the important means of protection against stress is • and <i and, of course, the fulfilled mode is IIIM 11p '^ the time specified in it for work, study, • idle time, entertainment, physical activity and pro i < •• Idas g prerequisites for the successful implementation of all the deceased confidence that you will succeed. This, in turn, allows you to do everything in detail, the size of the “i i” excluding rush fraught with nervous breakdowns, o * | -i rk, non-observance of hygiene standards. In addition to m \ <the rhythmic rhythm of the routine makes it easier to turn 1 mm. , the transition from one activity to another, • vi less effort, ie nervous tension and "motsny.

Where to start drawing up the schedule? First of all, it is necessary to determine the ratio of

sleep and wakefulness. Sleep has an extremely large effect on the state of the nervous system.

I.P. Pavlov and his students found that the main physiological significance of sleep is to protect the cells of the cerebral cortex from overvoltage. During normal night sleep, the physiological balance in the body is restored, which is reflected in all its systems. Moreover, such a recovery cannot be compensated in any other way. In addition, sleep is of particular importance to those who want to grow up. No wonder people say that "children grow up in a dream." This is confirmed by scientific research. It is at night hours that the maximum level of growth hormone occurs, and, therefore, at this time the most intensive growth occurs. How do you sleep? If 8-9 hours a day, then you need only to maintain a healthy lifestyle, that is, to feel good exercise regularly, eat rationally, give up bad habits. If you suffer from insomnia, then urgently you need to start fighting it in all known ways. First of all, teach yourself to go to bed at the same time (preferably before 11 o'clock). If you still do not fall asleep for a long time, try the methods that are offered in this book. Perhaps some of them will be yours. Before going to bed, take a warm foot bath (10-15 minutes, you can add mustard) or a shared bath with the addition of tincture of valerian root or motherwort. Drink tincture of valerian root or motherwort one hour before bedtime. Take a short walk before bedtime (25-30 minutes), listen to calm, quiet music. Use auto-training. For the purposes of preventing neurosis, it is also important to learn how to "train" your emotions, to treat people favorably, to extinguish conflict situations, not to attach importance to the minor mistakes of others and to be critical of your own. There is such a psychological game, "I am good." The bottom line is this: you give yourself or your loved ones a word, a certain time (to start 2 hours) to respond to any unpleasant situation with a smile. For example, they stepped on your foot in the bus and said rudeness. joke. With this, you disarm ■ my offender and you see that the conflict will not take place. I "try to follow this recipe at

work, and I'll succeed. Scientists have long proved that the best way to physical education (physical education, physical labor, games, exercise - Nin to the music.) Therefore, I would like to warn those who try to do their homework more quickly and sit still, this is a gross mistake. It's a good idea to go for a walk first, exercise a gym, then sit down with a fresh head lessons. On foot they will be carried out if after each, p. g I) 60 minutes to take a break for 10-15 minutes. In the p | i i break, it is best to perform several Finn "CPC exercises. Try, and immediately feel - m, and it's only easier to sit down at the textbooks again, and their affairs are faster and more successful. i 'and. another means of relieving stressful situations and> t smile and laugh, the so-called laugh therapy. I.IFЖ I amazing property of the soul. It adorns l \ and ii person, is the standard of health and good. swarming. A person with an open natural smile i i i is attractive, disposes others around him. IOK.I and laughter are the causative agents and conductors of i> i p gel emotions. They lead to good; they help us live, work, communicate and your to dig. The great Mozart said: "Life is a smile even when tears flow down your face ...". A smile creates a beneficial atmosphere for communication. A friendly smile usually causes a reciprocal smile and a corresponding mood among others. A joyful person is transformed. Such a person has a sharpened perception and sense of beauty, relations with others improve, and creative activity becomes more fruitful. With a smile, you can influence the flow of thoughts, emotions, modifying the tension of the muscles of the whole body, and especially the mimic muscles. A variety of central nervous system overloads - tensions, stresses, insomnia - are accompanied by very characteristic facial expressions. Becomes less expressive facial expressions, confusion, fear, numbness, lethargy are manifested on the face. Facial expressions are sluggish, sometimes vice versa, overly active, etc. Therefore, let's smile more often! So, a natural smile and healthy laughter have a beneficial effect on the state of health and behavior of

a person, on the properties of his personality. A good mood is necessary for the patient in order to recover, and healthy in order not to get sick. No wonder people say that laughter is the best medicine. A great way to create a good mood is to engage in physical activity, which, as I.P. said Pavlov, "gives muscle joy." To maintain a good mood and well-being, you need to learn how to switch from one activity to another in time, especially when another activity is related to your hobby. It will distract you, calm, improve your mood. When switching in the cerebral cortex, a new focus will appear, which, as it were, extinguishes, inhibits the old one, which caused fatigue or negative excitement. In addition, well-planned and organized rest favors good nourishment and well-being. Many people nowadays live in ecologically unfavorable areas, rarely are in the lap of nature. A pogrom during a vacation or vacation, or on similar days in the lap of nature gives a person a lot of positive emotions, the necessary energy. Types of recreation are diverse and should be chosen in accordance with their capabilities. The main thing is that rest brings joy, well-being, health, strong nerves, cheerfulness and vitality. And finally, a person who does not seem to have difficulties ("an overcomeable barrier, is resistant to stress, because efforts and struggle are life itself for him. And a person who expects that the benefits of life will come to him" It's not very costly and doesn't make any effort, either cheap or physical, rather gives a depressive reaction to stress. Such a person may be afraid of hope, anticipating its collapse. He especially needs I>. and plague self-regulation. Even in the most, it seemed would os (in reliable situations, one must act, one must overcome stresses. A good encouraging example is the I I rush about frogs caught in a pot of sour cream. One of them considered the situation hopeless and ... went to the bottom. Other ps could reconcile, it was fluttering, fluttering, it was sour cream in a lump of butter and ... jumped out. Any purposeful activity reduces actions and stress. Only active confrontation can- (I'm circumstantial of it can

change something and not: at least partial successes will appear, and with them positive emotions. How can they become familiar with the basic means of preserving the nervous system and opposing the “i Rossi”, you will maintain your health, and this, in your * ii-red, will help everyone to ensure normal II growth.

CONCLUSION

So, you have become acquainted with the most effective means of increasing growth. Their availability and usefulness is not in doubt. And although the desire to grow up is basically the lot of young people, when appearance is of particular importance for them, strength, nevertheless, anyone who wants to strengthen their health can be sure of the benefits of the advice given in this book. The desire to grow up is definitely a worthy goal. Especially if it does not overshadow the study, work, social life. This goal will help a person gain confidence in his abilities, be happy. Life shows that if a teenager cannot achieve an appropriate standard, he may have a feeling of inferiority, anxiety and aggressiveness, hostility, possibly the development of antisocial behavior. Fortunately, it is in the young years that you can help increase growth by using, in particular, the tips provided in this book. The question of how much growth can be increased is decided individually in each case. In any case, with hard training due to improved posture, everyone can add a few centimeters, even one who has already completed the growth period. Performing sets of exercises by people who continue to grow will certainly help increase their growth. The main thing is not to wait for quick results. They will come in a year and a half after the start of regular classes, because the body listens, looks at what is offered to him, and only then responds. But responds necessarily! Set short-term goals so that you can feel that you are achieving something every day. As your fitness improves, set yourself higher and more complex tasks. If some form of activity starts to bother

you, come up with new ones that could \ n G) s to add variety to classes. If you record your goals and training loads, then after a few months • review them. You will be surprised how quickly your fitness improves, and <lgdly, each time you will be convinced that you are at 11 1>. A good way to achieve your goal. When choosing a time for classes, be inventive and fierce. Use all your free time to jump, hang, stretch, play basketball or swim. Team up with my friends, then you will be more fun to do and much more interesting. But you can do it alone - • i ii *. Do not make any indulgences, force yourself to be lazy. Remember that you can only increase your height if you strictly observe all the necessary requirements. You can perform physical exercises, temper, it will go down the drain if it is irregular and you will eat properly, not enough sleep, and smoke. Growth is one of the most generalizing functions of the body, so it's not surprising that it's the right thing to do. a healthy lifestyle allows you to maximally i i mi juve the hereditary program, i.e. grow up. N <I know how much my story will satisfy all ** IIIII grow up. I want to wish you great luck, and I'm capable of achieving the goal even when no results are visible on m «I m pores. After all, G.I.I i 'period (more than two years), when my growth is absolutely i 1. 1 m i plsya. But I firmly believed that I would grow up - after all, I'll give a note to my coach, whom I loved very much and um * i iл And now, when I re-evaluate everything that happens, <<her more inclined to believe that the main thing was mi believe, much to wish!