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NEW DISCOVERIES ALL OVER THE EARTH

How the CHILD BECOMES A MAN SURPRISING CHANGES Which Take Place in the Bodies of GROWING CHILDREN

How the CHILD BECOMES A MAN

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On examining the skeleton of a baby the peculiarity first noticed is the striking difference between its relative proportions and those of an adult. The baby's head is remarkably large, and is no less than one-fourth of the child's total height, while the head of an adult is only one-eighth of the height. Baby's legs, on the other hand, are relatively short, measuring only about three-eighths of the height as compared with one-half in the adult. The ratio of head to legs is therefore two to three in the baby and one to four in the adult. This is why babies look as though their bodies were too big for their legs, and their heads too big for their bodies.

also to the fact that the face develops slowly, and does not attain its full size until quite late in life. The lower jaw, with its milk teeth and its muscles of mastication still immature, is particularly small, and this makes the distance from the mouth to the point of the receding chin very short. The upper jaw is also undeveloped, the teeth not yet having been cut. Since the baby's face is largely composed of the upper and lower jaws, it is completely overshadowed by the cranium.

As soon as a baby begins to walk its weight is transmitted along the spinal column to the bones of the pelvis, and thence through the legs to the ground. The force of gravity acting on the baby's skeleton for several hours daily quickly modifies its form, and changes its infantile characteristics. The spinal column, which at birth runs almost straight from the base of the skull to the pelvis, gradually develops the curves which persist throughout life. The pelvis, which is very small in proportion to the child, increases in size, and the arches of the feet begin to shape themselves.

All these changes are due to the force of gravity, which begins to act parallel to the length of the body as soon as the child walks, and also to the child's muscular efforts to hold itself erect, move about and protect its little body from shocks.

Atmospheric pressure is another force which has a pronounced effect on the baby's skeleton. This effect is particularly noticeable in the thorax, which gradually loses its funnel shape.

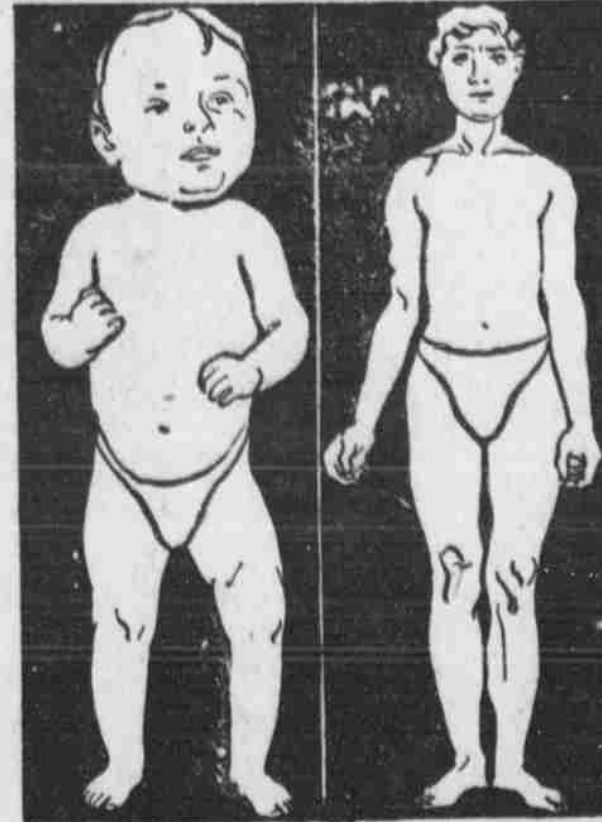
The child's growth in height has two periods of maximum intensity. The first period covers several months immediately following birth; the second begins in girls about the twelfth year and in boys a trifle later. Between these two periods the growth is much

more gradual. At the close of the second period the rate of growth diminishes again. Boys, as a rule, cease to grow tall at the age of seventeen and girls at the age of fifteen.

After a child has passed the infancy stage its increase in height is subject to many variations. For example, the growing boy or girl will measure over one-third of an inch taller in the morning than in the evening of the same day. This is due to the fact that the erect posture during the daytime puts the body's weight on the spinal column, compressing its segments, increasing its curves, and lowering the arches of the feet on which the weight eventually falls. A night's rest in a horizontal position overcomes this change, and by morning the body has returned to its full height.

The season of the year is another important factor influencing a child's increase in height. The increase is fastest from April to July, and slowest from August to December. Growth is retarded by school work, but quickened by play, particularly if it involves open-air exercises.

The child's increase in weight follows a curve which rises rapidly at first, but becomes less and less steep



In This Illustration the Figure of a Baby Eleven Months Old Has Been Enlarged to Equal in Height That of an Adult. A Comparison of the Two Figures Shows the Profound Changes in Form and Relative Proportions That Are Gradually Effected During the Years of Growth.

until adolescence is completed. It speeds up perceptibly in girls at about the twelfth year, and in boys about two years later.

The average weight of a baby at birth is seven pounds. A healthy baby will double this weight in five months, treble it in another seven and quadruple it in another eighteen. During the first weeks of life the daily gain in weight is about one ounce; from the third to the fifth week three-fourths of an ounce; from six to eight weeks one-half ounce, and from then until the end of the first year, two-fifths of an ounce.

As is well known, the first few days of a baby's life are marked by a loss of weight. This loss is most pronounced during the first twenty-four hours; and it is usually not before the end of the first week that the original birth weight will be regained.

Of course, all of these figures are only averages and do not apply to every child. Sometimes a child loses weight perceptibly during the night. The reason for this is that frequent feeding during the daytime adds to the child's weight. At night its meals are less frequent, and do not add to its body enough material to counterbalance the loss of water through the lungs, skin, etc.

One thing parents and nurses should remember is that increase in weight does not necessarily mean growth. It may represent merely an extra deposit of fat which is sometimes very undesirable.

Badly fed children, when first given suitable food, show a rapid rise in weight, but this is an indication of fat deposit rather than growth.

Although a baby's brain is very inactive at birth, its rate of growth is extremely rapid, and by the sixth month its weight will have nearly doubled. After the sixth month it grows slowly, and by the end of the seventh year it will weigh not quite twice what it did at the six months period.

Ways of Fighting Summer Pests

FLIES are the king of midsummer pests and their contemptible majesties may rule or ruin our health and comfort.

Like mosquitoes, these buzzing irritants are sensitive to oils or strong odors. Dip a brush into oil of sarafra and paint the door and window frames with it. Or wet a cloth in a half pint of warm water into which you have poured a dozen drops of oil of lavender, and wash the windows and screens with it.

An effective fly trap can be made by mixing one teaspoonful of cream, one teaspoonful of brown sugar and a teaspoonful of black pepper. Place the mixture in a shallow dish and then leave the flies to their fate. The cream and sugar will be the decoys and the pepper the exterminating agent.

Another trap for unwary flies is made of a teaspoonful of dissolved gum arabic and the same quantity of honey and brown sugar. A pinch of alum added to this puts the finishing touch to the fly's career.

Where flies have been there inevitably follow fly marks. To remove them is likely to deface the picture frames or toilet silver upon which they have settled. Better than removal is prevention. Wash the articles in water in which onions have been boiled and the flies will give them a wide berth.

Ants are not only troublesome, but some varieties, notably the large red ants are deadly. A child that was left alone tried to find amusement in a hill of red ants found instead

death. The insects literally stung him to death. A lump of camphor will keep ants out of your clothes closets.

A simple way of causing the evacuation of an ant city in your yard or garden is to dig a hole near it and place a bottle filled with water in the hole. The ants will swarm about it and despite their reputation among scientists for sagacity will climb to the rim, hesitate for an instant, then, undeterred by the sight of the floating bodies of their comrades, plunge to their death. The popular theory is that the smell of water maddens them. Certainly it appears that it has the power to turn their ant heads.

If ants have made inroads into your home, find the hole or crack through which they come, fill it with quicklime and then pour boiling water over it. Pulverized borax sprinkled about their haunts sometimes drives them away. Smearing molasses upon jars and other vessels infested with ants is a good but not a neat way of trapping them. A most effective method is to pour a half and half solution of carbolic acid down the hole or crack through which they come.

The stings of bees, gnats, wasps or hornets may be successfully treated by applying to the affected part, either with a piece of clean muslin or a sponge, a mixture of equal parts of ammonia and of castor or olive oil. A strong solution of salt and water will be found helpful in alleviating the pain.

SCIENCE has at last placed its finger upon the exact birthplace of the cyclones from time to time work devastation through the West. According to Dr. Emil Schildenkranz, an eminent German meteorologist, who has been visiting this country, the cradle of the cyclone lies in the town of Yuma, Colorado. There is born and nurtured the whirling tornado—the deadliest type of destructive wind, a veritable dancing dervish of the gales.

Yuma lies about 136 miles east of Denver, in the foothills of the Rocky Mountains. Its altitude is forty-one hundred feet.

It is generally agreed among the weather experts that the destructive whirling winds are caused by a vacuum which forms in the air and produces a dark, funnel-shaped cloud that whirls about with tremendous force in the manner of a Summer-resort merry-go-round.

As soon as this vacuum forms, the air rushes in to fill it, because, as the text books say, nature abhors a vacuum. The air is then apt to swirl about in a circle or spiral which results in a twisting wind or cyclone.

Bearing these things in mind, Dr. Schildenkranz determined to locate the spot where natural conditions made the formation of vacuums most likely. He studied the trail of the recent cyclone that swept through north Kansas and expended its chief fury on the city of Omaha and followed it to its mysterious beginning

The Town Where the CYCLONES ARE BORN

in Colorado. He was not satisfied until he came to Yuma, the little town on the eastern slope of the Great Divide.

Careful study of the environment of this town soon convinced the scientist that his task was completed—he had found the cradle of the cyclone.

Dr. Schildenkranz gives two reasons for his contention that Yuma was the birthplace of the recent cyclone and was probably responsible for many previous ones.

In the first place, he observed that the climate has sharp alternations of heat and cold. This is one condition making directly for the creation of vacuums in the air. The days are intensely warm in Summer. Last month, for instance, the thermometer climbed several times to 108 degrees. Yet the nights were always cool. Sometimes they were so cold that the townspeople found it necessary to close the doors and windows and to build fires in the stoves and fireplaces.

In the second place, the soil at Yuma is covered with the short, crisp, curling grass named after the buffalo, because it resembles the hair of his coat. Like the buffalo, buffalo grass is becoming extinct but in and about Yuma it still grows in profuse quantities. This grass, curling close to the earth, the scientist avers, reflects the heat more strongly than any other natural medium. Dr. Schildenkranz says the dreaded paving stones of the city streets have only half the reflective

power of this closely curling grass. A walk about the prairies covered with it will confirm his theory, for it flings back the heat so strongly that it causes the face to become sunburned even on a cloudy day. The grass, by forming a blanket covering the earth, prevents the absorption of the heat by the earth. The burning sun's rays that would otherwise be absorbed in the ground are flung back by the grass into the air, twice heating it, and so creating the vacuum that is the preparation for a cyclone.

During his visit there in weather which the oldest citizens pronounced ordinary and moderate, he studied the air with his telescope and distinctly saw through that magnifying medium the formation of three tiny but unmistakably funnel shaped clouds.

Yuma itself, Dr. Schildenkranz says, is like a typhoid germ carrier, of whom we have examples occasionally in a community. While diffusing germs of typhus these persons never suffer from them and while breeding and cradling tornadoes and cyclones, Yuma is itself peacefully immune from them.

Yuma is situated in the middle of a wide prairie. It enjoys the cool breezes that sweep downward through the canyons of the Rockies. It is vaulted by its four hundred inhabitants, and justly boasts, a natural sanitarium. Asthmatic patients, convalescents and neurasthenics flock there for cure and find it; but Yuma, like its human prototypes, has faults, and its fostering of cyclones is the chief.

TERRAPINS to Be Grown on FARMS

THE experts of the Government Fisheries Bureau have found out that terrapin can be successfully and profitably bred under artificial conditions. There is money in the business.

Terrapin cannot be raised in the back yard. There must be salt water, with a rising and falling tide. The water must overflow the breeding ground (barring the egg bed, as presently to be explained), and there must be a suitable enclosure to prevent the turtles from getting away.

In plenty of places along the Atlantic Coast are natural tidal ponds which might easily be converted into terrapin farms by inclosing them with a tight board fence. The fence should be set back from the margin to prevent shipworms from attacking the boards, which ought to be seven feet long and driven three feet into the ground. At one end there should be a sloping bed of sand for egg laying, built up twelve inches above the extreme high-tide level. It will not do to have water overflow the egg bed.



How a Natural Pond Can Be Utilized as a Terrapin Farm. A—The Pond. B—Fence. C—Egg Bed. D—Outlet of Pond. E—Enclosure for Young Terrapins. F—Fence Around Laying Beds.

Across the tidal outlet of the pond should be a gate of small iron bars set close together in a wooden frame or a corresponding arrangement of heavy galvanized iron netting to prevent the escape of the terrapin. Provision must be made for the young turtles in a separate enclosure somewhere about the pond. It is necessary to allow a water area of ten square feet for each adult terrapin.

In case a natural pond is not available a fairly satisfactory enclosure can be made on almost any low piece of ground to which salt water can be conducted by ditches or through which a salt creek flows. The ideal situation for the purpose is a swampy area of considerable size, all of which (except the egg bed) is covered at high tide, but from which at low tide the water does not entirely disappear. This gives the terrapin an opportunity to crawl about and sun themselves.

Good terrapin for breeding may usually be got from dealers. But the females purchased should measure six inches along the middle of the lower shell and the males four inches. The male terrapin has a longer tail and a smaller head than the female, but does not grow nearly so big. There should be twice as many females as males in the turtle pond.

When the female is ready to lay she climbs up on the sand bank and scoops out a jug-shaped hole eight inches deep with her hind feet. Then she backs as far as possible into it and drops her eggs, eight or nine in number. Finally she replaces the sand, packs it down, conceals the spot by crawling back and forth over it, and goes away. She never revisits the place nor takes the slightest interest in her offspring after they are hatched.

The laying season begins as soon as warm weather arrives. Care must be taken not to disturb the eggs. It will not do to dig them up or tramp over the bed. Rats

will eat them if they get a chance, so if rats are about they must be trapped or poisoned. In eight or nine weeks the eggs will hatch. The first young ones may be expected to make their appearance about the middle of August, and from that time on a few will be seen from time to time crawling about the bed.

To prevent them from escaping the egg bed should be inclosed by a low fence with a cap board of smooth dressed lumber, which affords the little terrapin no foothold. Their climbing ability is astonishing. They can ascend to the top of a rough board fence with ease, and by selecting a corner in which to climb can make their way over a concrete wall three feet high.

The young ones that are noticed crawling about should be picked up and placed in tubs. Kept in the shade and provided with finely minced fish for food. Most of them, however, remain in the nests beneath the sand and should not emerge until the following Spring. But after time has been allowed for the hatching of all the eggs it is best to dig

up the little turtles, in order that they may receive proper care. This may be done by scraping the sand away with the hands to a depth of eight inches, starting at one corner of the egg bed. Now, the little terrapin may be dealt with in either of two ways. They may be kept warm through the following Winter and regularly fed, or they may be allowed to hibernate. If the latter method be chosen a box three feet long and half as wide, a foot in depth, is prepared, with top, bottom and sides of galvanized wire net it has a hinged cover. Sunk in the ground in a place where drainage is good, so that the top of it shall be level with the surface, it is filled with sand and the small turtles are buried in it at a depth of five inches. They are left to take care of themselves. When Spring arrives they will come out.

If they are to be fed through the Winter they must be kept in a heated building, where the temperature will not fall below 70 degrees in the coldest weather. Under such conditions they show no desire to hibernate, and they grow, whereas the little terrapin fast asleep in the sand remain the same size. When newly hatched they are a little over an inch long. In the following year they add an inch to their size and during the next Summer another inch. Up to the third Summer it is impossible to distinguish the sexes, but as that season progresses the difference becomes manifest, and the females grow faster.

The breeder may expect to have on hand a few saleable specimens at the end of four years and a good many by the end of the fifth year. The males have little market value, and those not wanted for propagating purposes should be got rid of as soon as their sex is positively ascertained.

One man can easily take care of several thousand terrapin in a hatchery.

How Children Are Now Being Taught TO READ WITHOUT Learning Their A, B, Cs

MOST children know instinctively that there is something wrong about the uninteresting and stupid alphabet. It doesn't seem reasonable to them, and they hate it. Now, it seems that they are right.

Progressive educational students have hit upon a plan to teach children to read by the new and efficient method of sound reading, which eliminates the necessity of learning the A B Cs.

This new method is recognized as one of the most important discoveries in modern educational systems and bids fair soon to come into general use.

The whole system of the English language is based upon sound. Every word spoken is made up of one or more distinct sounds. No one speaks a word without giving utterance to some of these sounds. When we say cat, we do not name the three letters, as c-a-t, but we give the sound of "c" and "at" blended together and get "cat."

The child by this new sound-reading method is taught to work out words by means of what is known as the family group. After learning the sounds of the consonants the child takes up different families, as the "at," the "an" and the "in" families, and builds words as "cat," "rat,"

"m-at," "m-an," "r-an," "t-ill," "r-ill," etc., etc., adding little by little until a large vocabulary is acquired. This is the foundation of the new method of teaching known as the phonic method.

The first important thing for the child to learn is reading, in order that it may be able to gain information for itself. It is therefore of the greatest importance that the child be taught this as soon as possible.

With the time-wasting alphabet, a child was considered somewhat of a prodigy that could master the letters and their order at the age of five years. Many months were wasted by the children in having those twenty-six characters implanted in their minds. It has been demonstrated by the new phonic system that children can acquire the ability to read in much less time than by the old A-B-C method, and advancement is much more rapid.

Sounds and not names of letters should be mastered first, for words are only sounds or combinations of sounds. If the name of the letter is learned first, as under the old method, it interferes with the appreciation of the sound element in the word and unnecessarily complicates the process of learning to read.

After the child has commenced to read and has acquired a vocabulary and the ability to recognize certain words, the names of the let-

ters and spelling are introduced. The primary work, however, is to teach the child to read, and a knowledge of the alphabet is not necessary to accomplish this.

By the phonic method the child is taught to recognize the word and its name as a whole. For instance, the word dog is recognized, taken in and absorbed by the child as one thing in its entirety, instead of learning the three distinct characters of which the word is composed. It is just as easy for the child to do this as to resort to the old, cumbersome method of picking out the three separate characters.

Many who are teaching reading by the old A-B-C method think that is the best possible way, but the Modern Progress League has shown by actual practice that under the new plan children can be taught to read quite intelligently without knowing a single letter by name.

One of the advocates of this system was questioned as to whether this phonic reading would not tend to make the child a poor speller. He said: "I do not believe the new method makes poor spellers. But I do think the old system of striking out the silent letters in words did affect the spelling. On the whole, I think children read and spell much better and in a much shorter time when taught by the phonic system."

Making Your Camping Trip Do You Good

SELECT for your camp ground an elevation beside a lake or stream, if possible, where it will be exposed to the sun at least a part of the day.

If you use a tent, pitch it so that when it rains the water will drain away from it, and have the front so placed that the sun will shine as much as possible inside. An open camp, with the front toward the sun, is much preferable to a tent.

A very comfortable and healthful bed can easily be made with balsam or cedar boughs thickly spread upon the ground. If these are not obtainable use spruce or hemlock boughs.

Take a short sun and air bath, the entire body being exposed every day the sun shines. Make it quite short at first, and as the skin gets accustomed to the sun's rays make the exposure longer. The head should be partially

protected, at least until you become accustomed to the exposure.

During this sun bath exercise moderately, and rub yourself all over briskly with the hands or a coarse towel.

This sun and air bath has a powerful effect upon the skin, strengthening it, improving circulation, and making it more active in its work of removing waste matters from the system.

Take moderate exercise of some kind every day, rain or shine. Walking, rowing and climbing mountains are good kinds of exercise. Swimming is excellent. Avoid violent or excessive exercises. Too much is worse than none. You should conserve your vitality during your vacation and not waste it.

Eat plain, nourishing food, but do not eat too much. Take time to chew your food thor-

oughly. Pea, bean and lentil flours are easy to carry, and made delicious soups. They are very nutritious and easy to prepare. Evaporated milk is another desirable article. Chocolate is a very convenient and satisfying lunch for long trips. Drink plenty of water, but be sure it is pure.

Practice deep breathing early and often. Get the habit, and it will do wonders for your health and strength.

Those addicted to the habit of smoking, and desirous of breaking themselves of it, can more readily do so while enjoying a vacation of this kind than when at home amid their customary surroundings. Life in the open air eliminates the craving for tobacco, and if once the habit is broken there is no reason why it should ever be allowed to take hold again.

Above all things, leave all cares and worries behind the minute your tent is pitched.