

Average Sleep Ration 25 Years

Psychology

By DONALD A. LAIRD

Dr. Laird is the director of the Colgate Psychological Laboratory.

Rip Van Winkle slept for twenty years. This record is surpassed by the average man who lives out his allotted three score years and ten, for the seventy-year-old person has spent more than twenty-five years in sleep.

Sleep overtakes an individual at the close of his day's work, and after about eight hours it releases its hold. Beyond this the average person and most scientists know little. Scientific workers who have devoted their time to intensive studies of sleep number scarcely a dozen since the beginning



IN THE SLEEP LABORATORY: A row of the "human guinea pigs" who dedicated themselves to the cause of finding out why and how human beings sleep



DR. DONALD A. LAIRD, director of the Colgate Psychological Laboratory, who tells of his experiments on how and why we sleep

of the scientific era; while in contrast there are at the present moment more than 100 scientists working on how to make the face more attractive by surgical procedures.

At the Psychological Laboratory of Colgate University we have been trying to find out all we can about sleep, especially what is practical and best.

Beginning three years ago at Colgate, volunteer subjects slept in quarters that the fraternity houses loaned us for temporary use. The investigation has grown and expanded from that beginning, until next year an entire ten-room house will be used for the sleep laboratory.

Since the field has been practically untouched it has been necessary to plan and construct much apparatus for studying what goes on in people while they sleep, and how sleep can be made most restful.

Some of the apparatus is constructed so that time is measured not in merely seconds or tenths of seconds, but in thousandths of seconds. In measuring muscular relaxation, which appears to be of paramount importance in restful sleep, we have had to devise other instruments which will tell us the effect a single twitch of a finger has upon the total muscular relaxation of the sleeper's body.

We have had to develop special methods to measure the exact amount of bodily energy expended when

doing work after sleep of various kinds and amounts.

The greatest difficulty in the experimental work is in the loss of sleep it demands from those being experimented upon and those doing the experimenting. It is somewhat of a lark to stay up unusually late one night. But when the experimenters request that you get along with six hours of sleep every night for a month in place of the eight you have been accustomed to having, the fun disappears the second night about ten o'clock. Nevertheless we were able to get some students to make this sleep sacrifice without credit or pay three years ago.

We have also had our "human guinea pigs" sleep with a gas mask glued to their faces for a half year of nights at a time so that we could make chemical analyses of the expired air the whole night long. In this particular case the more severe hardship fell upon those making the experiments since they had to keep wide awake all night to make accurate determinations of the energy expenditure of those enjoying sleep. Two subjects sleeping peacefully with gas masks will keep ten others awake making the chemical analyses of exhaled breath collected through the masks.

Other cruel and inhuman practices are essential in order to discover the what and why of (*Turn to next page*)

Sleep—Continued

sleep. Imagine yourself, for instance, being awakened at four o'clock this morning and put through strenuous tests for an hour and a half on this incomplete amount of sleep; tests which range from how much electricity is needed to shock you, to lifting weights with your middle finger every second until you are exhausted and unable to lift even an ounce.

Then further imagine you are awakened for the same work at three o'clock two mornings later, then at two o'clock, and so on until all the hours of your sleeping period have been tabulated and charted. It takes considerable determination to stick through a job like that when you also have your regular work to do during the daytime when sensible people

work exclusively. But you can never fully appreciate the complete pleasure of a long Sunday morning sleep until you have been through a semester or two of such work.

It comes to many people as somewhat of a surprise to find that another hardship is changing from a medium soft, comfortable bed to a hard and sagging bed. This demands more will power in some cases than to cut down on one's hours of sleep. But sleeping in uncomfortable beds is just another of the cruel and inhuman things we require of our subjects from time to time, although there are thousands of people complacently sleeping on beds far from comfortable or right and blissfully ignorant of the fact. Since our boys have slept

around on different combinations of mattresses and springs in the laboratory they have found that differences in the restfulness of two beds may be as marked as changes in the weather.

The best bed combination to sleep upon to obtain most restfulness seems to be a medium soft bed with a large number of vertically placed coil springs. A bed which sags keeps muscles under tension and does not allow for a desirable amount of restfulness.

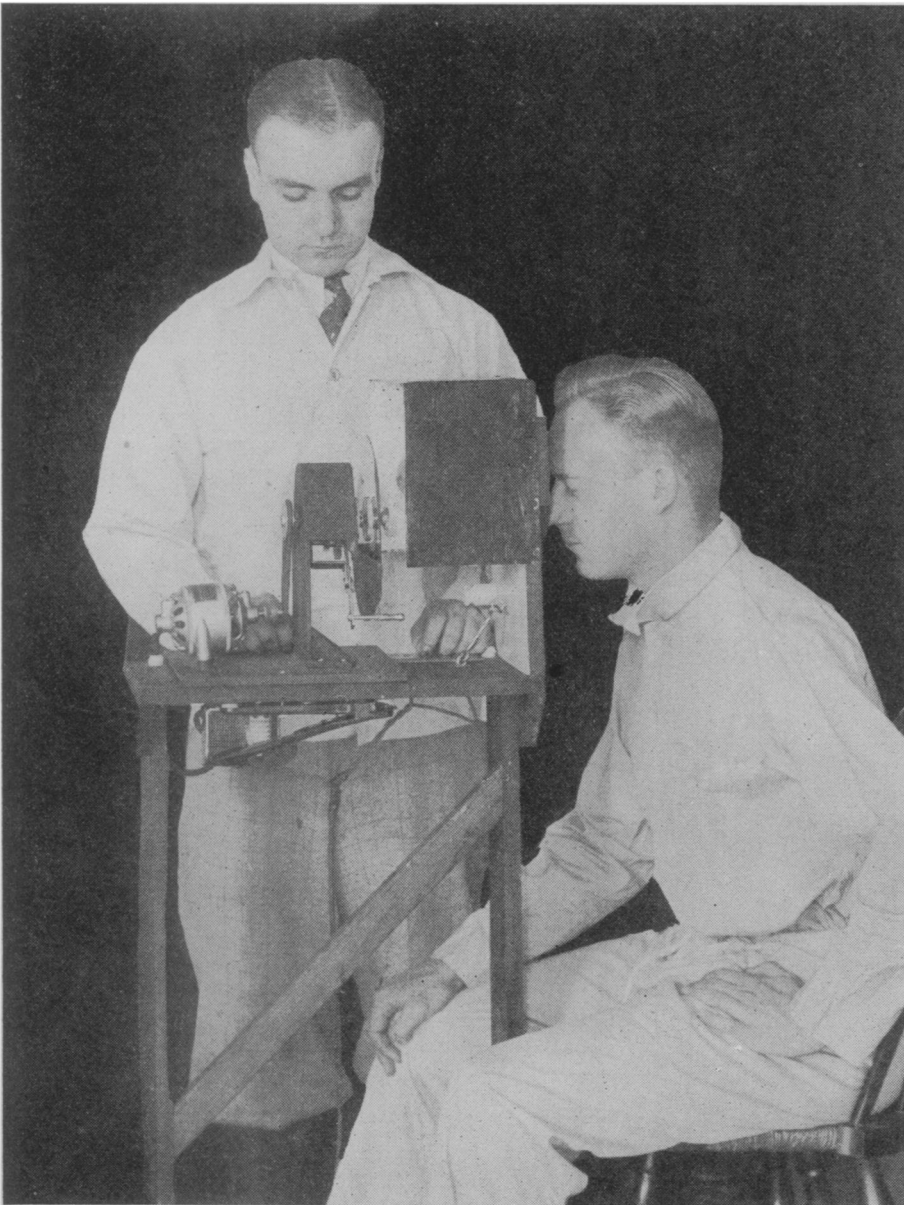
We were somewhat astonished to find that a bed can be too soft, especially for the person of above average weight. In some of the tests seven hours sleep on some beds gave a recovery equal to eight hours on other beds. The type of spring and mattress found in practically all college dormitories gives a poor sleeping combination. A praiseworthy charity to undertake on a national scale is to replace these since a poorly rested person is the weak-willed person.

We have found that the old idea that sleep is deepest the first few hours expresses the truth. It does not matter whether the first two or three hours come before midnight or after midnight. More noise is necessary to awaken a person during the first hours of his sleep. If he is awakened it is harder for him to keep awake. There is intense bodily metabolism due to the rebuilding activities taking place. And recovery of ability to do strenuous tests appears more marked after the first two or three hours' sleep than during the following six hours.

It is probably fortunate that we cannot do away with the first two hours' sleep. Otherwise some people trying to cheat nature might do as the Irishman who enlisted in the army and found that his blanket was so short that when it covered his feet it did not reach to his chin. So he cut six inches from the bottom of his blanket and sewed it to the top.

We have also found that if you cut down on sleep you will probably have to pay a price for it. After the loss of even two hours' sleep we have found that difficult mental work is adversely affected, and almost invariably more calories of bodily energy are required to do the work than were needed when the regular amount of sleep had been maintained.

Napoleon is sometimes cited as having got along on unusually small amounts of sleep. (Turn to page 365).



TESTING THE EFFECT of too little sleep on vision

Sleep—Continued

But we must remember he was a broken man at the age most men are in their prime. Regarding the small amount of sleep Thomas A. Edison is said to take, Harvey Firestone says he has a good laugh every time he hears the story. Edison has always taken innumerable cat-naps during the day and although his night sleep may have been short, his total daily amount was that of the average man.

There are indications that the average person is not getting enough sleep to fill nature's requirements. This is evidenced by the need of alarm clocks to get many people started on the day's work, and by the widespread popularity of getting caught up on sleep on Sunday mornings.

Many changes unknown to the individual take place during sleep. When a noisy taxicab passes a sleeper's window, for instance, there is a change in his blood pressure caused by the noise, although the sleeper is not awakened at the time. Between four and six o'clock in the morning, when sleep is light, these disturbances which we do not consciously sense are responsible for the predicament of many persons who wake and toss about restlessly. The crash of a garbage can onto a paved alley or the passing of the milkman have caused many worries about "what's the matter with me that I always wake up at five o'clock lately?"

With each question about sleep we have answered, the answer has raised a dozen new questions which are important and which can be answered in turn only by experiments. We have discovered, for instance, that during the first two hours of sleep there are some rather intense body rebuilding activities taking place. What these are we do not know, and moreover this is a question to be answered by the chemist. Chemists working in the United States Public Health Service and at the University of Chicago have not found what this chemical rebuilding is.

A race which does without sleep, however, is well on the road to a race of mentally disordered people, probably within the first generation, for sleep is not merely a great restorative, but its dreams are often a safety valve for sanity. So when such a pill appears, if ever, I would warn you still to take no substitute for real sleep, lots of it, under the best conditions, and dream pleasantly to your heart's content.

Science News-Letter, June 9, 1928

High Speed Not Harmful

Aviation

By THOMAS CARROLL,

Mr. Carroll is chief test pilot of the National Advisory Committee for Aeronautics.

High speeds "nearing the limit of endurance of human body" are being frequently reported in aviation. Automobile speed tests also give rise to similar expressions.

Anything over two hundred miles an hour seems sufficient to excite the phrase. And it would be just as untrue if the speed were a thousand miles an hour as though it were twenty-five.

Speed itself has no effect whatever. At least we have found none at three hundred miles an hour. True, if parts of the human body are exposed to the direct wind of such speedy passage unpleasant consequences must be expected. But this is not in contemplation, for the person attaining these speeds is carefully shielded from the wind.

There is no doubt that the human body would not stand such speeds were they shot from a gun or from a catapult, but in any ordinary means of flight or locomotion there is no element of acceleration comparable to that.

The human body does not stand acceleration well. This is well known and proven. Rapid acceleration or deceleration drives or draws the blood away from the nerve centers producing momentary blindness or other malfunction of the body. But fortunately, it is almost impossible to continue the force for more than a moment and the after-effects seem to be conspicuous by their absence. The first symptoms of the effect appear in an amber tinting of the vision, as though you had clapped on a pair of amber glasses, followed, if the acceleration is maintained, by darkness. The recovery is rapid and complete.

The effects are made negligible by either of two extremely simple means, by wearing a corset-like belt such as is worn by polo players, or simpler still, by letting out a good lusty yell.

Science News-Letter, June 9, 1928

An anonymous philanthropist has promised the University of California \$5,000 a year for the rest of his life to be used in studying the prevention of children's diseases.

A carload of 300,000 insect specimens collected in the Malay Archipelago during 15 years has reached the Smithsonian Institution at Washington.

NATURE RAMBLINGS

By FRANK THONE

Natural History



Scarlet Tanager

If you hear something that sounds very much like a robin's song, but punctuated with a frequent "chip-churr," it is the scarlet tanager you are listening to. He should not be difficult to see, either, for he is as conspicuous as a Kentucky cardinal, though his red is of a slightly different shade. There is no reason for confusing him with a cardinal, however, for he has no crest, and his wings and tail are black. It is really a most striking uniform, worthy of the brave days of the eighteenth century, when regiments were as brilliant as the poppy fields they deployed in.

The tanager, however, sports his grenadier coat only while he is courting, and during the early days of his family responsibilities. After that he sheds it and takes on a sober civilian suit of olive green, to match his wife's dress; for unlike the cardinal's mate the female tanager is not privileged to sport a brilliant turnout of her own.

Tanagers are found only in well-wooded places. They are not the neighborly suburban burghers that robins are. They are not hermits, though, and will make their nests in parks and on large estates where there is plenty of timber. They are especially fond of oaks.

The range of the scarlet tanager is wide enough so that most of us can have a chance to see the bird if we seek him with patience and a discreet quietness. It covers all of eastern North America, and the winter migration grounds extend as far as northern South America.

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Of the 5,000 paintings on exhibition in the Louvre in Paris, about 100 have been pronounced frauds, following elaborate X-rays and spectograph studies.