

ANIMAL PHYSIOLOGY

Insomnia Bothers Sheep

► SHEEP, which some people count to fall asleep, do not sleep themselves. Nor do cows.

Part of the trouble seems to be that sheep and cows keep themselves awake because of their own cud chewing. To add to their sleepless plight, both groups of animals can lie down at night in a specified position only. Unlike humans with insomnia, sheep and cows cannot toss and turn, it is reported in *Nature* (May 28).

A study of the plight of these animals was made by Dr. C. C. Balch of the National Institute for Research in Dairying at the University of Reading, England. He reported that some cud-chewing animals have to keep their thorax in an upright position. In addition, the digestive habits of these animals depend to some degree on gravity, and tilting the organs the wrong way leads to trouble for the animals.

Sleepless nights are a characteristic of healthy adult cattle and sheep only, Dr. Balch found. If sleep does occur, he said, it is only of a very light nature.

Grazing animals frequently chew their cud for about nine hours out of every 24, and this ruminating is somewhat concentrated at night, Dr. Balch suggested. This led him to believe that the constant chewing and regurgitation have a disturbing effect on the animal.

Furthermore, Dr. Balch said, having to keep the head in the unsupported position found during the rumination period requires a good degree of consciousness on the part of the animal.

Dr. Balch also pointed out that sleep in the horse is normal, noting that stabled horses in Germany were reported to have averaged seven hours sleep out of 24.

Science News Letter, July 16, 1955

METEOROLOGY

Drought Relief by 1957

► THE PREVAILING drought that has hit the Midwest since 1952 will end by 1957, Dr. Charles G. Abbot, former Secretary of the Smithsonian Institution, has predicted.

He also said that 60-year weather forecasts are now possible for any place in the country for which sufficiently detailed local records are available. These predictions would give general trends only, Dr. Abbot said, and might be wrong for particular years due to unforeseen factors such as volcanic eruptions and heavy bombings.

Dr. Abbot predicted the rainfall in St. Louis for 100 years, both backward and forward from 1897, then checked his forecasts against Weather Bureau records. For 70 out of 100 years, he came quite close to actual conditions.

He bases his predictions on 23 interacting weather cycles, requiring complicated statistical analysis of records. The pattern of these interacting cycles repeats itself about every 22 years, Dr. Abbot's studies have shown. Essentially the same pattern is found in fluctuations in the solar constant, Dr. Abbot believes.

The solar constant is the standard measure of the heat from the sun beating down on the top of the earth's atmosphere. Smithsonian scientists have measured it nearly every day for 35 years.

Variations in the solar constant are small, about one percent, and most meteorologists doubt that such small changes can have as much effect on the weather as Dr. Abbot believes.

Dr. Abbot pointed out that it is not necessary to assume that weather patterns and variations in the solar constant are related. The 23 periods, he said, "exist in

temperature and precipitation, however they may be produced."

Nevertheless, Dr. Abbot believes that weather cycles depend directly on solar cycles, although solar effects on temperature and precipitation may be somewhat delayed in time.

Most meteorologists agree with Dr. Abbot that changes in the amount of solar heat received by the earth affect the weather, but they are not sure exactly how. Many of them are attacking the problem of solar effects on weather by various methods.

Science News Letter, July 16, 1955

MEDICINE

Twice Weekly Exercise Advised to Keep Fit

► MANY TRADITIONAL setting-up exercises, including touching your toes, are of little value if you want to keep muscles toned up and waistline trim.

However, the average adult can keep in good physical condition by means of two ten-minute sessions of exercise a week, according to Dr. Laurence E. Morehouse, professor of physical education at the University of California at Los Angeles and one-time adviser on physical fitness at West Point.

He emphasized that this does not mean 20 minutes a week of toe-touching, deep knee bends, arm waving and other traditional setting up exercises.

"Bending over and touching your toes," he points out, "actually does more harm than good. That is because such calisthenics stretch back muscles already

stretched to flabbiness by constant sitting down."

A home exercise program recommended by Dr. Morehouse would include activities of this nature:

1. Vigorous warm-up exercise for several minutes such as running in place. This will build up endurance.
2. Stretching exercise for neck and lower neck.
3. Abdominal toning exercise such as slow leg raising from a prone position.
4. Arm and shoulder exercise such as pushups from floor, wall or table.

Science News Letter, July 16, 1955

SCIENCE NEWS LETTER

VOL. 68 JULY 16, 1955 NO. 3

The Weekly Summary of Current Science, published every Saturday by SCIENCE SERVICE, Inc., 1719 N. St., N. W., Washington 6, D. C., NORTH 7-2255. Edited by WATSON DAVIS.

Subscription rates: 1 yr., \$5.50; 2 yrs., \$10.00; 3 yrs., \$14.50; single copy, 15 cents, more than six months old, 25 cents. No charge for foreign postage.

Change of address: Three weeks notice is required. When ordering a change please state exactly how magazine is now addressed. Your new address should include postal zone number if you have one.

Copyright, 1955, by Science Service, Inc. Reproduction of any portion of SCIENCE NEWS LETTER is strictly prohibited. Newspapers, magazines and other publications are invited to avail themselves of the numerous syndicate services issued by Science Service. Science Service also publishes CHEMISTRY (monthly) and THINGS of Science (monthly).

Printed in U. S. A. Entered as second class matter at the post office at Washington, D. C., under the act of March 3, 1879. Acceptance for mailing at the special rate of postage provided for by Sec. 3440, P. L. and R., 1948 Edition, paragraph (d) (act of February 28, 1925; 39 U. S. Code 283), authorized February 28, 1950. Established in mimeographed form March 19, 1922. Title registered as trademark, U. S. and Canadian Patent Offices. Indexed in Reader's Guide to Periodical Literature, Abridged Guide, and the Engineering Index.

Member Audit Bureau of Circulation. Advertising Representatives: Howland and Howland, Inc., 1 E. 54th St., New York 22, Eldorado 5-5666, and 435 N. Michigan Ave., Chicago 11, Superior 7-6048.

SCIENCE SERVICE

The Institution for the Popularization of Science organized 1921 as a non-profit corporation.

Board of Trustees—Nominated by the American Association for the Advancement of Science: Kirtley F. Mather, Harvard University; Paul B. Sears, Yale University; Karl Lark-Harowitz, Purdue University. Nominated by the National Academy of Sciences: Edward U. Condon, Berkeley, Calif.; Harlow Shapley, Harvard College Observatory; George W. Corner, Carnegie Institution of Washington. Nominated by the National Research Council: Ross G. Harrison, Yale University; Leonard Carmichael, Smithsonian Institution; Jerome Hunsaker, Massachusetts Institute of Technology. Nominated by the Journalistic Profession: Neil H. Swanson, Ruxton, Md.; O. W. Riegel, Washington and Lee University; Michael A. Gorman, Flint Journal. Nominated by the Scripps Estate: Edward J. Meeman, Memphis Press-Scimitar; John T. O'Rourke, Washington Daily News; Charles E. Scripps, Cincinnati, Ohio.

Officers—President: Leonard Carmichael; Vice President and Chairman of Executive Committee: Charles E. Scripps; Treasurer: O. W. Riegel; Secretary: Watson Davis.

Staff—Director: Watson Davis. Writers: Jane Stafford, Marjorie Van de Water, Ann Ewing, Horace Loffin, Howard Simons, Edward Hausman. Science Clubs of America: Joseph H. Kraus, Margaret E. Patterson. Photography: Fremont Davis. Sales and Advertising: Hallie Jenkins. Production: Priscilla Howe. Interlingua Division in New York: Alexander Gode, Hugh E. Blair, 80 E. 11th St., GRamercy 3-5410.