

winter, and moderately good at some time in fall. Wide variations from this schedule may occur, except that a high (though not always maximum) production is always to be expected at some time in spring.

While we do not yet have evidence in shape for formal presentation, it may be of interest to note that my experience in Southern California gives me the impression that we have much heavier production for one or two years after a season of heavy rainfall than we do in years following light rainfall. This idea is, of course, related to my supposition that heavier production of diatoms reported for high latitudes is largely due to favorable conditions of drainage from land.

The number of species in a catch was rarely as great as forty, and catches of excessive size usually showed a large number of species in spite of the fact that only one or two forms contributed the excessive number of cells. Some species were represented in all territories from Peru to the Aleutian Islands. Most prominent of these was *Chaetoceros debile* Cl. Some species seemed to be more nearly confined to higher latitudes. Prominent amongst these was *Thalassiosira nordenskioldii* Cl.

Many plankton diatoms are exceedingly variable in size, form and appendages. The two ends of a single chain have sometimes been found to exhibit differences characteristic of separate species. The range of variability is not noticeably greater in one area than in another.

Although not strikingly abundant, resting spores were more commonly observed in Alaskan material than in any other.

Our plankton material has not been closely studied for separation of species. In a small number of catches examined by Dr. Mann, of the Carnegie Institution, he reported the finding of a few new species. It is probable that extended search would reveal several new forms from all Pacific regions.

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SCRIPPS INSTITUTION OF OCEANOGRAPHY

## RICKETS, ULTRA-VIOLET LIGHT AND MILK

THE prevention and control of rickets could probably be accomplished were it possible to furnish to the infant suitable amounts of the anti-rachitic substance in its food, mother's serum, or milk. The fact that ultra-violet light, properly used, will prevent or cure rickets leads to the hypothesis that ultra-violet treatment of the mother might cause the anti-rachitic substance to be increased in the milk which she gave. To test this hypothesis Holstein-Friesian cows of nearly the same age and calving date and receiving like treatment as to feed, tem-

perature, etc., were placed side by side in the university dairy barn. Throughout the experiment these cows did not leave the barn. For one month none of the cows received ultra-violet light. For the second month two cows received ultra-violet light fifteen minutes a day generated from a Cooper-Hewitt alternating current light at three feet above their backs. For the third month these cows received ultra-violet light for thirty minutes a day under the same conditions. In the meantime Rhode Island Red chickens were allowed to develop rickets, shown both clinically and by X-ray photographs. They were divided into two lots, one lot of three chickens receiving milk from the ultra-violet cows, the other of two chickens, milk from the control cows. Both lots received all the milk they wished.

The chickens have now been under treatment fifty days. The lot receiving milk from cows exposed to ultra-violet light are in good condition with no appearance of rickets in X-ray plates. The lot receiving normal milk has moved progressively toward more extreme clinical and X-ray rickets. The experiment has been repeated, using the milk from these same cows on White Leghorn chickens showing clinical and X-ray rickets. Five chickens were in each lot. After thirty-eight days' treatment four of the lot receiving milk from the ultra-violet cows are almost cured of rickets, showing only a very slight stiffness. The fifth chicken shows some stiffness. Four of the lot receiving the normal milk show constantly increasing symptoms of the more advanced stages of clinical rickets. The fifth chicken, with less fully developed rickets at the start of the experiment, now shows little change from its original appearance. Thus while this anti-rachitic milk is an effective agent for the treatment of rickets, it is not in our experience, as immediately effective in treating rickets in severe form as suitable amounts of cod-liver oil or direct exposure of the animal to ultra-violet light.

These results point to the conclusion that more of the substance necessary to cure rickets is absorbed by the cow exposed to ultra-violet light and secreted by her in her milk. The cows prevented from receiving ultra-violet light are not able to secrete this anti-rachitic substance in sufficient quantities to cure or allay the progress of clinical rickets. The results thus point to an environmental factor transmitted by the cow to her offspring through the medium of her milk. It further suggests that the high incidence of rickets in children during the late winter months is due to their mothers' not receiving enough ultra-violet light either during pregnancy or while in lactation. Furthermore, it would appear that cows' milk produced especially for baby feeding

should be from cows which have access to ultra-violet light either from the sun or some other source.

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### THE FEDERATION OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY

THE Federation of American Societies for Experimental Biology, which is composed of the four organizations, the Physiological Society, the Society of Biological Chemists, the Society of Pharmacology and the Society for Experimental Pathology, held its annual meeting at Western Reserve University Medical School, from December 28 to 30, 1925. The meetings were largely attended, representatives being present from all parts of Canada and the United States.

Joint sessions were held on Monday morning and Wednesday afternoon, at which times papers of somewhat more general interest were presented. It is impossible to review all these adequately here, although they were all of merit. A few may be mentioned. Drs. J. O. Ralls and E. A. Doisy, of St. Louis University, with their coworkers reported on the isolation and standardization of the hormone in the liquor folliculi. The transplantation and immortality of certain mammalian tissues, particularly cartilage, was discussed by Dr. Leo Loeb, of Washington University, St. Louis. Drs. Rogoff and Stewart, of Cleveland, demonstrated that if the surgical technique was correct dogs might live six to seven days after removal of the second adrenal. Drs. Murlin, Mattill and Austin, of the University of Rochester, investigated the relative biological values of corn, wheat and oat products in the so-called breakfast foods. From the Mayo Clinic Drs. Mann and Bollman reported on removal of the liver. After partial removal rapid regeneration was noted and doubt was thrown on liver dye tests in the dog. Dr. Scott, of Columbia University, criticized the handling of data by most physiologists and showed how series of observations could be evaluated by the use of correct mathematical formulae. Dr. A. C. Ivy, of Northwestern, demonstrated the auto-transplantation of the pancreas into the mammary gland of the dog. Secretion of pancreatic juice continued, which is proof of a humoral secretory mechanism. Dr. E. C. Kendall, of the Mayo Clinic, has continued his studies on thyroxin, showing that bromin might replace the iodine without destroying the hormone action. Drs. H. Cushing and

<sup>1</sup> With the cooperation of C. C. Little, E. R. Tobey, L. S. Corbett and H. W. Hall.

S. J. Maddock, of Harvard, described an ingenious method of clipping the stalk of the pituitary and thus preventing its secretion from passing out of the gland. Complete data concerning the percentage of the various salts in the blood were presented by Dr. A. B. Macallum, of McGill. The relation of chemical structure to the usefulness of a substance in the treatment of neuro-syphilis and trypanosomiasis was discussed by Dr. A. S. Loevenhart and Mr. Stratman-Thomas, of the University of Wisconsin.

At the opening session the members of the federation stood for a moment in silent tribute to those deceased during the year, namely: J. N. Langley, honorary member, Cambridge, England; A. W. Hewlett, Stanford Medical School; John Marshall, University of Pennsylvania; R. A. Spaeth, Chulalongkorn University, Siam; F. C. Cook, Bureau of Chemistry.

Among the actions taken by the federation at its council meeting the following may be mentioned:

It was recommended that the next annual meeting be held in the spring of 1927. This change from Christmas to spring is in the nature of an experiment and it is hoped that it may settle the age-long controversy between the merits of these two dates.

The federation voted to enroll as associate-members for the annual meeting all those appearing on the program by invitation and those registered from biological laboratories. This was done to make the younger workers feel that they have a legitimate part in the activities of the federation and also by virtue of increased numbers to make possible more satisfactory arrangements for the annual meeting.

The Cleveland meeting was held under the chairmanship of Dr. A. J. Carlson, of Chicago, president of the Physiological Society. The place of the next meeting has not yet been decided. Dr. E. C. Kendall, of Rochester, Minnesota, president of the Society of Biological Chemists, will serve as its chairman. Dr. F. C. Koch, of the University of Chicago, will act as general secretary.

The Cleveland meeting was one of the most successful ever held by the federation. On Monday evening Western Reserve University gave a complimentary dinner to the members. President Vinson and Dr. A. J. Carlson were the speakers of the evening. Dean Hamann presided as toastmaster. The federation dinner and conference of biological chemists occurred Tuesday evening. The arrangements throughout were satisfactory to the last detail, for which the federation formally thanked the administration of the university and the local committee, consisting of Drs. H. T. Karsner, *chairman*, C. J. Wiggers and J. M. Rogoff.

WALTER J. MEEK,  
*General Secretary*