The report on the Canadian survey, with accompanying directory, has already been submitted to the Carnegie Corporation. To complete the survey there remains Australia, Tasmania, New Zealand, the West Indies, and outlying possessions. The Canadian and South African surveys were made by Sir Henry A. Miers and S. F. Markham; the Mediterranean, by Charles Squire and D. W. Herdman. The Museums Association plans to publish a directory of museums in the dominions. This, with the directory of museums in the British Isles, published last year, will form a directory of the Museums of the British Empire.

THE first International Congress of Mediterranean Hygiene will he held at Marseilles on September 20, under the auspices of the medical faculty of that town, and under the patronage of the President of the Republic. The conference, which lasts for five days, will include discussions upon undulant fever, dengue, the de-ratization of ships, *spirochétose espagnole* and *fièvre exanthématique méditerranéenne*. An excursion to Provence has been arranged for September 25. Special terms are offered in respect of boat and railway fares and accommodation. The president of the congress is Professor E. Marchoux. For further information applicants are invited to communicate with Professor H. Violle (general secretary), Faculté de Médecine, Palais du Pharo, Marseille.

A WESTERN States Regional Outlook Conference was held at Salt Lake City, on August 11 and 12, under the auspices of the Bureau of Agricultural Economics. Representatives who attended were Dr. O. C. Stine, in charge of the division of statistical and historical research; C. A. Burmeister, livestock, meat and wool division; H. M. Dixon, in charge of the economics extension unit, and Frank Andrews, statistician for Utah. The bureau economists explained, by use of charts, the factors affecting economic developments in agriculture in the last decade, and the information thus presented was used as background for the commodity discussions—on dairying, wheat, beef cattle and sheep. After these studies and explanations of charts the economists asked the extension men to say what kind of advice they would give farmers under certain conditions. About fifty people attended the meeting, including extension and research workers of the various state colleges of agriculture in the region.

THE Royal Research Ship, *Discovery II*, operating under the direction of the Falkland Islands government and carrying a crew and five British investigators, has sailed into the Antarctic to estimate the whale population of this region, according to a report from the American Consulate at Melbourne, Australia. The party will also gather data to serve as the basis for an international agreement to prevent overfishing and depletion of the whale herds. The vessel, which left London in October, 1931, has made two cruises. The first was from Cape Town, South Africa, to the fringe of the ice pack and then to Fremantle. The second was from Fremantle to the ice and then to Hobart, Tasmania and Melbourne. On the present trip, the vessel will go to New Zealand and from there it is expected that the northern waters of the Antarctic coast will be touched on the return to the Falkland Islands early in October this year.

DISCUSSION

LIGHT OR EXERCISE AS FACTORS IN SEXUAL PERIODICITY IN BIRDS?

IN an interesting review in *Nature*[1] of Professor Roman's book, "The Riddle of Migration," Professor MacBride accepts it as proven that increasing periods of wakefulness or of muscular exercise per day are the direct cause of the spring increase in the size and activity of the reproductive glands of juncos and, presumably, of other birds such as poultry, and not the increasing periods of exposure to light radiation as such. The acceptance and endorsement of this theory by a biologist of Professor MacBride's recognized standing may lead many to infer that the experiments supporting the statement of this theory were conclusive proof of the validity of the generalization to the exclusion of all other possible explanations of the results.

It seems worth while to inquire as to the conclusiveness of the experimental tests of the theory and the possibilities of other interpretations of the results of this single experiment, which is described by Professor Rowan himself in *Nature* in 1928,[2] so that the facts need not be recapitulated here. Taken alone, they appear to indicate that exercise caused the testes of birds, subjected to it, to increase in size, while those of birds not subjected to it did not do so. But the fact that increased exercise might be but a contributory factor, and not the major one operating, was not excluded.

Studies by Bissonnette[3, 4, 5] on starlings, in Hartford, Connecticut, in this connection, show that it is

[1] *Nature*, 129 (3259): 561–2, April 16, 1932.

[2] *Nature*, 122 (3062): 11–12, July 7, 1928.

[3] *Am. Jour. Anat.*, 45: 289–305, 1930. See p. 299.

[4] *Jour. Exp. Zool.*, 58: 281–319, 1931.

[5] *Physiol. Zool.*, 4: 542–574, 1931, and 5: 92–123, 1932.

the daily changes in radiation, as such, and not the changes in periods of muscular exercise, that modify the reproductive cycle and sex-glands of starlings.

Although Professor Rowan knew, from correspondence in the spring of 1929, the results of Bissonnette's experiments, he has taken no cognizance of them and has dismissed them as irrelevant to his subject—possibly because, in Hartford, starlings do not migrate. But their sex-glands do change in relation to exposure to light, just as do those of juncos in Edmonton, Alberta, as described by Professor Rowan. In his book he ignores these studies and fails to mention the possibility that the season of the year (March and April), in which he performed the experiments cited by Professor MacBride, and the previous activity of the sex-glands of his birds (already increasing in size and activity as the results of increasing daylight periods[2]), may have influenced his results, as well as his immediate experimental treatment. Bissonnette has already discussed this probability.[3,4,5,6]

Bissonnette's studies[7] and those of Bissonnette and Wadlund,[7,8] indicate that, in starlings, at least, testis size and activity are conditioned by daily period, intensity and wave-length of the light to which the birds are exposed; but that, with the several types of stimulating illumination used by them, testis regression invariably sets in after a variable period of complete sperm formation. This period is shorter in birds brought to the climax quickly, and longer in those more slowly activated. An optimum wave-length, somewhere in the red, and an optimum intensity of white light below 185.6 foot candles, and nearer 29 foot candles, are indicated. The type of food may be a limiting factor and prevent testis activation by such stimulating types of illumination, in some cases at least.

Bissonnette's analysis of the effects of increased daily periods of muscular exercise, both with and without changes in exposure to light, indicated that such increases of exercise prolonged the refractory period or led to a lag in the appearance in the testes of the activity-changes induced by changes of illumination, whether of increasing or of decreasing activity. With unchanged lighting conditions, increased exercise reduced the size of the testes, if those testes were in mid-winter quiescent condition. Acting on such quiescent testes, added exercise periods, given in the manner used by Professor Rowan, without added light periods, did not induce any increase of testis activity, but lessened it and caused the glands to become still smaller. If birds already undergoing activation by increasing illumination had their illumination reduced and their daily exercise periods increased, their sex-glands continued to increase in size for a longer period, before undergoing regression, than did those of birds with reduced light periods without added exercise (a reaction similar to that of Professor Rowan's birds). On the other hand, if birds were undergoing regression due to decreased light periods, those given added light and added exercise continued to regress longer, before beginning to increase in size and activity, than did those with added light but no additional forced exercise periods.[4] The conclusion was therefore drawn that, though increasing exercise periods were not themselves stimulating to sex-gland activity, they modified the response of the glands to the action of changing doses of visible radiations, which were potent to modify the sexual activity of these birds.

That these effects of changing conditions of illumination are not confined to birds, but occur in some mammals also, though in somewhat different manner and degree, is indicated by the studies of Baker and Ranson[9] on voles, and by Bissonnette[7,10] on ferrets. The differences, so far noted, between the responses of birds and those of mammals to this experimental treatment have been discussed elsewhere.[10]

The work of Wang,[11] of Wang, Richter and Guttmacher,[12] and of Bugbee and Simond,[13] with albino rats, has shown that spontaneous activity, as measured by a recording device, varies with the oestrous cycle and is greatest at the time of heat; that this is not found in males nor in ovariectomized females, but can be induced in castrated males by ovarian grafts, and in ovariectomized females by properly spaced injections of proper amounts of extract of ovarian follicular hormone. These changes in activity are the result, not the cause, of sex-gland changes. They lend support to the suggestion that, in fowl, as cited by Professors Rowan and MacBride, the increased sexual activity induced by increased illumination causes increased food consumption and consequent increased exercise to get it; instead of the increased muscular activity causing the increased sexual activity and food consumption.

The studies cited above show that the power of increasing exercise periods to induce sex-gland activity is not completely demonstrated. On the contrary, increasing exercise is probably, at most, only a modifying factor related to the time and rate of response

[6] *Nature*, 129 (3260): 612, 1932.

[7] Aided by grants from the Committees for Research in Problems of Sex and for Grants-in-Aid, of the National Research Council of the U. S. A.

[8] *Jour. Morph.*, 52: 403–428, 1931.

[9] *Proc. Roy. Soc. B.*, 110: 313–322, 1932.

[10] *Proc. Roy. Soc. B.*, 110: 322–336, 1932.

[11] Comp. Psychol. Monographs, Series 2, No. 6, 1923.

[12] *Am. Jour. Physiol.*, 73: 581–599, 1925.

[13] *Endocrinology*, 10: 349–399, 1926.

of the sex-glands to changes of light—the factors directly concerned in causing the changes observed by Professors Rowan and Bissonnette.

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PROFESSOR TROLAND AND DR. KUNZ

THE multifarious activities of such men as Professor Leonard Thompson Troland and Dr. George F. Kunz, both of whom died during the early part of this summer, makes it impossible for a biographical note to refer to all their widely scattered activities. Perhaps you can find space for this brief additional tribute.

Dr. Troland published several important papers on the nature of life and life processes, *viz.*: "The Chemical Origin and Regulation of Life," *Monist,* January, 1914; "The Enzyme Theory of Life," *Cleveland Medical Journal,* 15, 377–389 (1916); "Biological Enigmas and the Theory of Enzyme Action," *Am. Naturalist,* 51, 321–350 (1917). Extensive quotations from these papers are given in a paper by Alexander and Bridges in "Colloid Chemistry, Theoretical and Applied," Vol. II (Biology and Medicine), pp. 18–21. These papers of Troland are well worth the consideration of all biologists.

Dr. Kunz, among his many other social and scientific activities, was deeply interested in chemistry, and at the time of his death was president of the American section of the Société de Chimie Industrielle. He had long been collecting for the American Museum of Natural History specimens of the known chemical elements, and had himself contributed to the nearly complete collection many specimens of historic interest, *e.g.,* part of the rare atmospheric gases first isolated by Sir William Ramsay. On June 28, the day before his death, Dr. Kunz discussed with me matters concerning the American section, and evinced a keen interest in current scientific matters and affairs.

JEROME ALEXANDER

SOME NEW AGAR DIGESTING BACTERIA

DURING the course of some studies on the bacteria responsible for changes brought about in an experimental trickling filter receiving a creamery waste, a number of organisms were encountered which were distinctive in that they digested the agar medium upon which they were grown. A study of these cultures was undertaken in hopes that it might throw some light upon their rôle in the purification process, as well as upon their ability to digest agar.

These cultures were divided into three distinct groups, and since a survey of the literature showed that they had not been previously described, they are therefore described as new species.

Achromobacter pastinator nov. sp: gram negative, non-spore-forming, short rod; motile by means of peritrichous flagella. Colonies small, almost colorless and producing definite liquefaction of agar media. The colonies sink into cup-like depressions in the agar. Acidity is not produced from carbohydrates, although many such compounds are utilized as carbon sources, as shown by chemical analyses.

Pseudomonas lacunogenes nov. sp: gram negative, non-spore-forming, short rod; motile by means of a single polar flagellum. Colonies orange yellow, slightly raised, smooth, butyrous and causing slight depressions in the surface of agar media. No definite liquefaction takes place, although the agar is softened. Acid is rarely produced from carbohydrates, although chemical analyses indicate that many of these compounds are utilized. This organism also utilizes such nitrogen compounds as cystein, asparagin, aspartic acid, tyrosine, alanine, glutaminic acid, ammonium succinate and peptone as sources of both carbon and nitrogen. It also utilizes ammonium sulphate, ammonium chloride and ammonium phosphate as sources of nitrogen, when dextrose is present.

Pseudomonas segne nov. sp: gram negative, non-spore-forming, short rod; motile by means of a single polar flagellum. Colonies orange yellow, slightly raised, smooth, butyrous and causing slight depressions in the surface of agar media. No definite liquefaction takes place, although the agar is softened.

The action of this organism on carbohydrates is identical with that of *Ps. lacunogenes.* There is, however, a marked difference between these two organisms in their ability to utilize nitrogen compounds, *Ps. segne* being unable to utilize any of the nitrogen compounds listed under *Ps.* lacunogenes as a nitrogen source except peptone.

A full description of the morphology and physiology of these organisms will be published elsewhere.

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A NEW YELLOW PEROMYSCUS

THE discovery of a new coat color mutation in mammals is sufficiently uncommon to justify its announcement as a special event. We take some pride, therefore, even if we deserve little credit for the production, in making public the discovery of a new dilute yellow (or dilute brown) *Peromyscus.*

The mouse appeared first as a segregant, in a litter of four, in a stock of *Peromyscus maniculatus gambeli,* which was being used in a joint genetic investigation of white spotting in this species. Subsequently, three other similar yellows appeared, all of them