reversible way. The methods used, especially iodine catalysis and melting of crystals, are now being applied to methylbixin. We have found that the *cis-trans* conversion mentioned above is reversible, and furthermore that not a single compound but a complicated equilibrium mixture of stereoisomers is formed. The latter can be separated on a Tswett column, using calcium carbonate (Merck's Heavy Powder) and benzene-petroleum ether mixtures.

So far 8 stereoisomeric methylbixins have been observed on the column, above and below the all-*trans* zone; of these several have been crystallized. They differ spectroscopically by 0–16 mμ from the all-*trans* compound which possesses the longest wave-length maxima (490, 457 mμ in petroleum ether). On addition of iodine the spectra of all these stereoisomers shift to about 488.5, 455 mμ.

A new type of rapid isomerization was observed with fresh methylbixin solutions at 20°. No all-*trans* isomer was present in this equilibrium, and it appeared only upon iodine addition.

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SEAWEEDS AT BEAUFORT, NORTH CAROLINA, AS A SOURCE OF AGAR

RECENT articles on methods for reclaiming used agar, on preparation of agar substitutes, and on means of conserving agar give evidence of the increasing concern over future sources of supply, especially for bacteriological requirements.

Agar has been produced commercially on the California coast for a number of years, and this production has been increased considerably during the past few months. However, agar for bacteriological purposes apparently is not being produced along the Atlantic coast. The long-established "Irish moss" industry of Massachusetts seems to be the nearest approach to the production of bacteriological agar in the eastern United States.

On June 1, 1942, an investigation of possibilities of producing agar from seaweeds of the North Carolina coast was begun at the Duke University Marine Laboratory at Beaufort, N. C. Although this work is still in its early stages, it has seemed advisable to announce certain findings because of the pressing need for new sources of agar.

The plans of this work include a systematic test of all the more common, larger species of red algae of the Atlantic coast from Beaufort southward to the Florida Keys but especially in the vicinity of Beaufort.

The most common red alga in certain parts of the Beaufort region during summer is *Gracilaria confervoides* (L.) Greville. Hoyt[1] states that it is present from April to November and that this species has been used "for the making of jellies in a way similar to the use of the 'Irish moss,' *Chondrus crispus,* of our northern coast." Preliminary tests indicate that from 25 to 35 per cent. of the air-dry weight of this alga is agar. Its wet weight is about 17 times that of the dry weight. Agar has been produced from this species at the Duke University Laboratory since about June 15 and has satisfactorily met bacteriological requirements.

The method of preparation used is similar to that given by Field.[2] Freshly collected material is washed with sea water and spread out to dry and bleach. From three days to a week are required for this process. Daily sprinkling with sea water is necessary to make bleaching complete. Whether or not the material is damaged by washing or wetting with fresh water has not yet been determined. When bleached and dry the seaweed is boiled in about 50 times as much fresh water by weight as seaweed. This is kept up to or above 50 per cent. of its original volume by occasionally adding more water during the boiling process. The liquid is then strained through several thicknesses of linen cloth and poured into shallow pans to cool and solidify. From this point on it is treated in a manner similar to that described by Thaller[3] for reclamation of used agar and a reasonably pure product is obtained. A 1.5 per cent. solution forms a sufficiently hard gel in a Petri dish to permit streaking with an inoculating needle.

If a purified agar is not required, 20 grams of dried Gracilaria may be placed in a cloth bag in a flask containing 500 or 600 cc of water (with nutrients if desired). This is autoclaved and the agar solution poured directly into Petri dishes for use.

Gracilaria confervoides is present in certain areas near Beaufort in large quantities and it can be collected with ease. In more favorable localities one person can gather 100 pounds wet weight of this material in an hour. There are many square acres of bottom that produce this alga in such abundance during summer months. Preliminary studies on the possibilities of cultivation of Gracilaria have shown a remarkable growth rate. Small stems about three inches long tied to pieces of tile and placed in a favorable habitat increased about ten-fold in two weeks during July.

Probably the second most common red alga of the Beaufort region during summer is *Hypnea musciformis* (Wulfen) Lamouroux. It is present the year

[1] W. D. Hoyt, *Bull. Bureau Fisheries* (*U. S.*), 36: 367–556, 1917.

[2] I. A. Field, Econ. Circ. No. 51, Bureau of Fisheries (U. S.), 1921.

[3] H. I. Thaller, SCIENCE, 96: 23–24, 1942.

around but less abundant during winter. Agar can be made from this species also; that produced so far has been of inferior but usable quality. Difficulty has been encountered in bleaching Hypnea, although perfectly bleached pieces are sometimes found along the beach.

Tests on species of algae that are not sufficiently abundant at any time of year to afford a significant supply of agar are being carried out in the hope that, should some exceptionally favorable species be found, methods for cultivation can be worked out. *Lomentaria uncinata* Meneghini, for example, yields a very high percentage of agar, but because it is such a small plant and not very abundant, it is commercially out of the question. Many species at Beaufort are restricted in abundance only because of the limited extent of suitable surfaces to which they can attach.

Early in June determinations were made on the alginic acid content of two species of pelagic Sargassum, *S. natans* (L.) Meyen and *S. fluitans* Børgesen. Apparently the alginic acid content of these is very small. Similar determinations are planned for all the more common, large species of brown algae.

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THE CAUSE OF DOMESTICATION

THE suggestion that the dog may have been domesticated in part for its value as a scavenger[1] may have some pertinence, but we should not forget that primitive people do not object to smells as much as we do, and that they seem to care very little about sanitation. Moreover, most of them lived so they could move easily and probably they did move rather frequently, thus wittingly or unwittingly solving the refuse problem.

While utility has been a great factor in all domesticating, it is not all-powerful, for, if it were, the list of domesticated organisms would be much larger than it is. In other words, we could profitably use the qualifications of many that have not been reduced to domestication.

It is nearly, if not entirely, true that prehistoric man did all the domesticating. Hence, if we are not prepared to admit that he had faculties along this line superior to those of historic man, we must conclude that the organisms domesticated, themselves contributed to the result. As the admission can scarcely be made, the conclusion is unavoidable. The dog is a clear example; it prefers to associate with man. Tamability exists in gradations; some creatures readily tame, others are refractory. The domesticated forms derive from the more susceptible kinds and, considering primitive man's success in contrast to advanced man's failure in domestications, it seems certain that the organisms involved must have had favorable tendencies to that state and must have helped to domesticate themselves.

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[1] SCIENCE, 96: 111–112, July 31, 1942.

OFFPRINTS FOR THE SCIENTIFIC MEN OF SOVIET RUSSIA

I HAVE recently received a letter, dated May 25, 1942, from Professor Alexander R. Luria, the prominent Russian psychologist. Professor Luria, whose book in English, "The Nature of Human Conflict," is well known to American readers and who was scheduled to visit this country to deliver the Salmon Memorial Lectures at the New York Academy of Medicine, is now in the Province of Cheliabinsk in the Ural Mountains. He is directing a clinic for the rehabilitation of the brain-injured in the war. He writes that he and his colleagues are very much in need of offprints from recent original American publications in the field of brain pathology and abnormal psychology, particularly those dealing with re-education and neurosurgery. He would like to receive such material as immediately as possible.

The American-Russian Committee for Medical Aid to the USSR, of which Prince Vladimir V. Koudasheff is the chairman and Dr. Michael Michailovsky is the treasurer, has kindly offered to transmit to Professor Luria literature sent to them and designated for him. Their address is 55 West 42d Street, New York, N. Y. It is also possible to mail directly to Professor A. R. Luria, Neurosurgical Rehabilitative Clinic of VIEM, Kisegatch Sanatorium, Cheliabinsk Oblast, USSR.

It is hoped that American scientists who have pertinent material will heed this call. It may furthermore be presumed that the needs of Professor Luria and his clinic are typical, and that in general American scientists who have formerly corresponded with Russian colleagues should continue sending important offprints that in some way bear upon war needs. Indeed, only three months ago the writer received a request from the Tbilisi Institute of Physiology for an offprint that is neither very important nor remotely related to war research. However, the situation has doubtlessly changed since, and correspondents may do well to discriminate for the time being in what they send.

The U. S. Post Office accepts first-class matter and printed material not exceeding four pounds and six ounces for mailing to the USSR, and wherever locations of institutes and universities have been changed, as many have, the Soviet authorities no doubt have the information for proper forwarding.

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