

mental Stress Analysis, as well as some three hundred and fifty manufacturers who will participate in the display.

THE Long Island College of Medicine announces its third intensive postgraduate course in industrial medicine to be given at the college from October 16 to November 3. The course will be conducted by leading physicians in industrial practice, authorities in allied fields and members of the faculty of the college. The main objective is to give those physicians engaged in or who may enter industrial medicine the opportunity to orientate themselves more fully to the field. Although arranged primarily for graduate physicians, others interested in industrial health may apply for admission. All inquiries should be addressed to Dr. Thomas D. Dublin, Department of Preventive Medicine and Community Health, 248 Baltic Street, Brooklyn 2, New York.

The British Medical Journal reports that an Academy of Medical Sciences has been founded in the U.S.S.R. The academy, whose members to start with will number fifty-six, is to be set up under the People's Commissariat of Health, and will have three departments: (1) medical biology; (2) hygiene, mi-

crobiology and epidemiology; and (3) clinical medicine. Each of these will be composed of several scientific institutes, twenty-five in all, many of which will be, in effect, an extension of the appropriate section of the All-Union Institute of Experimental Medicine which is being merged with the academy. An organizing bureau has been set up under the chairmanship of the People's Commissar for Health of the U.S.S.R.

It is stated in *Science and Culture*, Calcutta, that the Government of India plans to publish an Indian Pharmacopoeia. It has asked the Drugs Technical Advisory Board to prepare the material for a list of drugs in use in India and to recommend standards and tests with which to establish their uniformity, identity and purity. These drugs, although not included in the British Pharmacopoeia, are said to be of sufficient medicinal value to justify their inclusion in an official pharmacopoeia. The list, when approved, will be known as the Indian Pharmacopoeial List and will constitute the official Indian Supplement to the British Pharmacopoeia. A committee, of which Sir R. N. Chopra is chairman, has been set up to examine the material for the list and report to the board.

DISCUSSION

WAS THERE ICE AT COQUIMBO?

I THINK there was. I can not imagine anything else that could have carried rocks of such dimensions out to sea. Yet they now lie embedded in a coquina of subtropical shells. The rocks suggest a glacial epoch, but the fauna could not have lived in cold waters. The facts are these.

In latitude 30 degrees, south, the town of Coquimbo, Chile, stands upon a rocky ridge between the Pacific and Coquimbo Bay and spreads out on wave-cut terraces. Eastward, across the bay, the land rises steeply in a succession of terraces, cut upon strata of Pliocene and Recent age. It is clear that during Pliocene and Recent time the coast subsided and received deposits of the sediments that consisted in great part of the very abundant shells. The subsidence continued until the fronts of alluvial cones that are now about 475 feet above sea were at sea level. At some date during Recent time the movement was reversed, the land rose, and as it did so the Pacific carved terraces upon the horizontal strata. As the waves cut the terraces they mingled fossils of Pliocene age with shells of the current date and laid a trap for the unwary paleontologist.

The locality is classic ground. Darwin, who ex-

amined the terraces with characteristic thoroughness more than a hundred years ago, while the *Beagle* lay in the harbor, noted particularly the evidence of uplift. He described six levels or terraces and concluded that the rise had been a gradual one. He collected fossils, which were described by Sowerby and D'Orbigny as of Pliocene and Recent age. The German geologist, G. Steinman, also collected here and his fossils were studied by W. Möricke with the same result. But in neither case is there any account of the horizons from which the various species came. Darwin alone records that he found shells of species now living in adjacent waters as high as 242 feet above sea. I visited the region in 1923, when following up the tracks of the great earthquake of November 10, 1922, and with a thought of my Tertiary-minded colleagues at Stanford I collected from several levels up to the top of a bluff, 136 feet above sea, and also at Coquimbo from the coquina of a terrace 230 to 250 feet above sea. My collections were examined by my young friend, Eric Jordan, whose tragic death cut short the promise of a brilliant career, and he identified the suite of 31 species as Pliocene throughout. None of them could have lived in waters any colder than the present.

I came upon the big rocks at a somewhat higher level, where the strata may be post-Pliocene, but I was so intrigued by the problem of their transportation that I failed to collect at their horizon. I did not notice any change of fauna, but then, I am not a paleontologist. The rocks are embedded in coquina or lie upon the adjacent slope. The exposed surfaces of one buried one measure more than 6 feet on a side and there is another on the slope that is 23 feet long by 12 feet high. They are of a heavy, black igneous rock, which forms the walls of a little canyon, a quarter of a mile distant. About 30 feet above the horizon of the big rocks is another layer of smaller ones. Two horizons of erratics! In the heights of the Andes, even in this latitude, there are traces of glaciation and farther south there are evidences of two strongly characterized glacial epochs.

Assuming that the parallel of two horizons of erratics and two glaciations is not fortuitous, I have speculated that the rocks do record the presence of ice on the coast during each of the glacial epochs; that the Humboldt current was chilled by the flocs of spreading antarctic ice; and that in the latitude of 30°, where cold winds pushed under warmer air currents, there was heavy snowfall; snow accumulated in the shaded canyon in sufficient volume to form ice; and exceptional floods swept ice and rocks out to sea.

If that really was the case, the marine fauna of preglacial and interglacial time must have been killed off; it would, however, survive farther north and would have returned with post-glacial amelioration of conditions. We would expect, however, to find fine sediments and cold-water forms interbedded with the warm water deposits. If that evidence exists, it is obscure. Neither Darwin nor Steinmann detected it. I did not discover it, although I photographed the erratics and puzzled over their distribution. During the rise of the coast soft sediments might be entirely removed as they passed through the zone of that wave action whose power is shown by the strongly marked terraces. The record may have been washed away. Yet there should somewhere survive a pocket of glacial silt. One ought not to be surprised to find a subarctic foram in the east of a subtropic Venus. A fuller account of my observations is published in "Earthquake Conditions in Chile," Carnegie Institution of Washington, Publication 136, together with Eric Jordan's discussion of the fossils.

BAILEY WILLIS

ISOLATION OF VIOLACEIN

DURING the spring and summer of 1936 the writer worked under the direction of Professor Fritz Kögl at the University of Utrecht, on the nature of the

purple pigment elaborated by *Chromobacterium violaceum*. Samples of the crystalline pigment, violacein, were brought to this country by the writer, and have recently been made available to Dr. H. C. Lichstein, of the University of Wisconsin Medical School, who has investigated the toxicity of the pigment to a variety of pathogenic organisms. Since the substance appears to possess considerable antibiotic properties,¹ and since published procedures for its isolation² failed to yield a crystalline product,¹ it is considered desirable to make available the details of the isolation procedure used successfully by the writer at Utrecht. It is regrettable that it has not been possible to consult Professor Kögl prior to the publication of this note.

Sixty-five liters of a medium containing 5 g of peptone, 5 g of lactose and 3 g of Liebig's meat extract per liter, was distributed among 460 Erlenmeyer flasks of 750 cc capacity, and the flasks were sterilized by heating in the autoclave at 110° for 30 minutes. After inoculation with a heavily pigmented culture of the organism, the flasks were incubated at 22° for 14 days, and the cells then collected by centrifuging. The moist, purple bacterial mass (151 g) was rubbed up with 3 liters of acetone, transferred to a large bottle, and mechanically agitated for 30 minutes. The mixture was filtered with suction, and the cells were re-extracted as before with 1.5 liters of acetone. The combined acetone extracts were concentrated at reduced pressure from a 60° water bath to ca. 200 cc, allowed to stand at 5° overnight, and filtered. The nearly black, partly crystalline powder obtained was dried at 90° *in vacuo* over P₂O₅, and then weighed 906 mg.

The crude violacein prepared as above was placed in a Soxhlet apparatus and extracted for one hour with dry chloroform, and then for an additional hour with dry ether. The unextracted material remaining in the thimble was dissolved in 240 cc of boiling pyridine, filtered, the filtrate concentrated to ca. 150 cc and the hot solution diluted with 50 cc of boiling chloroform. The mixture was allowed to cool, and was then placed at 4° for several hours. The pigment was filtered with suction, washed with chloroform-pyridine (1:1), and with chloroform, and dried at 90° *in vacuo* over P₂O₅ for 2 to 3 hours. There was obtained 710 mg of pure violacein as a violet-black, micro-crystalline powder, consisting of thick needles and elongated rectangular crystals. The substance does not melt without decomposition.

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¹ H. C. Lichstein and V. vandeSand, *Jour. Infect. Dis.* (in press).

² W. C. Tobie, *Jour. Bact.*, 29: 223, 1935.