These specimens are apparently *Craspedacusta ryderi* (Potts.) According to Schmitt's[1] summary of the American records of *Craspedacusta,* and a recent note from him, this is the first report of its occurrence in Mississippi. It is possible that the hydroids were brought here on some water lilies from Independence, Ohio.

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SCIENTIFIC BOOKS

MINERS' DISEASES

The History of Miners' Diseases: A Medical and Social Interpretation. By GEORGE ROSEN, M.D. With an introduction by Henry Sigerist, M.D. New York: Schuman's. 490 pages. $8.50.

DR. ROSEN'S book covers the history of metal and coal mining from the earliest records, of Egypt and Greece, down to the beginning of the nineteenth century. The forty-odd years of this century, with their important contributions to our knowledge of the diseases of metal and coal miners, are not covered, and since American contributions to industrial medicine belong to this later period, the reader will find no citations from American sources in Dr. Rosen's book, our interest in such matters having been slow to awaken.

We usually think of coal mining when we speak of mines, but metal mining was far more important up to the nineteenth century, when coal began to be mined on a large scale, but in England only. Copper, tin, lead, sulphur, gold and silver have been mined from earliest times and metal mining has always been far more dangerous than coal mining, because the ores are more likely to contain the harmful free silica. Then too, such metals as lead, quicksilver and manganese are poisonous, while others, such as copper and zinc, may be rich in arsenic, and any metal ore may contain less familiar but poisonous metals, such as cadmium, selenium, tellurium.

Dr. Rosen finds in the earliest writings on mining and in those of the Middle Ages descriptions of miners' diseases which show that those which we still regard as occupational were recognized and attributed to conditions in the mines. These are "miners' asthma," silicosis; "miners' consumption," silico-tuberculosis; metal poisoning; sudden death from fumes of sulphuretted hydrogen or carbon monoxide; anemia from hookworm infestation; deformities of the joints caused by unnatural posture; pneumonia from the sudden change from the heat of the mine to the cold, winter air; rheumatism, from the dampness, and miners' nystagmus, a rapid, involuntary oscillation of the eyeball.

In Greek and Roman days, miners were slaves or convicts who sometimes staged violent revolts, as when, in the Peloponnesian War, 20,000 Athenian slave miners went over to the Spartans. The richest mines acquired by the Romans were the silver, gold, mercury and copper mines of Spain. Diodorus tells us that the life of the miner was brief, but so terrible were the conditions of his life that death was preferable. The quicksilver mines of Almaden in Spain are still the richest in the world and there the metal occurs in pure form, so that the air is always full of poisonous fumes. According to the latest published report (DeKalb, 1921) the miners' working time is still kept down to eight days of four and a half hours each in a month, this being the only method devised to keep down mercurialism. Justinian wrote that a sentence to these mines was almost equal to a death sentence, and Plutarch criticized a mine owner because he employed in his mines slaves who were not criminals.

Throughout the Dark Ages mining suffered a decline, as did all industry, and there is no writing concerning it, but in the sixteenth century two very full descriptions appeared, one by Agricola (whose real name was Georg Bauer) and the other by that extraordinary man, Bombastus ab Hohenheim, or Paracelsus. Agricola sees the dust, water and stagnant air of the mines as causes for the wasting disease of miners, which carries off so many young men that he has known women in mining villages who had had seven husbands. Stirring up stagnant water may set loose a gas which causes instant death, (H_2S?); firing to break the rock face produces another deadly gas (CO?) so that the prudent miner does it only on Friday evening, to give time for the air to clear over the week-end. The miner's day in 1556 was only seven hours and his week only five days, but the conditions under which he worked were evidently deplorable. Agricola describes various kinds of nervous diseases, which probably were caused by arsenic. He also warns against demons of ferocious aspect which haunt the mines and can be driven out only by prayer and fasting. Paracelsus also recognized the air of the mines as the chief source of injury, though he called it "chaos" and wrote about it in his usual chaotic manner. However, he is the first one to write a monograph on the occupational diseases of a definite group of workers, for Agricola was more interested in labor and economics than in medicine.

These two stand out as the great figures in indus-

[1] W. L. Schmitt, *American Naturalist,* 73: 83–89, 1939.

trial medicine, with many followers, especially in Germany, but no rival till early in 1700 when the Italian Ramazzini brought out his great book on the "diseases of artificers." That Ramazzini's motive in taking up this almost unknown branch of medicine was primarily humanitarian he makes clear, for he was a man of warm emotions, filled with pity for the wretched lot of the worker, but he was also a scientist and approached the problems with curiosity and a scrupulous search for facts. He attributes miners' diseases to two causes, noxious fumes and particles in the air and the violent exertions and unnatural postures which the work makes necessary. He was also a pioneer in preventive medicine, he insists on ventilating devices and protective clothing, especially in arsenic mines. His book is an epitome of the knowledge of miners' diseases from antiquity to the eighteenth century.

Many interesting writings are brought to light by Dr. Rosen, such as Mattioli's description of chronic mercury poisoning among the miners of Idria in the first half of 1600. It was in Idria that the first recorded law was passed for the prevention of occupational disease, when in 1665 a six-hour day was made legal. Another remarkable description is that of Hoffman of Halle, who gave a clear picture of the pulmonary cancer of the miners in the Erzgebirge of Saxon Switzerland, cancer which we now know to be caused by radioactive ores. It was another German, Scheppler, who first distinguished clearly between miners' asthma, silicosis, and miners' consumption or phthisis, silico-tuberculosis, long before the discovery of the tubercle bacillus. Up to the beginning of the nineteenth century the greatest contribution to the study of miners' diseases, both clinical and pathological, came from Germany and such names as Virchow and Rokitansky are associated with it.

With the rapid increase of coal mining in England in the nineteenth century the English contributions began to take prominence. Coal had been mined as far back as 1217 when Henry the Third granted the Forest Charter, but it was used chiefly by smiths and lime burners and did not come into domestic use till the sixteenth century, after which the use gradually increased, then, with the dawning of the industrial era, underwent very rapid growth. Tin, lead and iron had been mined for centuries, and the Cornish tin mines seem always to have been notoriously deadly, owing, we now know, to the free silica in the ore. As coal pits increased in depth, the "enemies of the miner" began to appear, water, foul air, dust, poisonous fumes, falling timbers and land slides, and, worst of all, explosions of fire damp and dust. These last were spectacular enough to attract public attention and led to Parliamentary commissions of inquiry, with physicians as members. As one would expect, the attention of the English investigators was directed not only to dangerous conditions in the mines, but to the wretched homes of the miners, and we read less about the pathology of the pneumoconioses than about practical methods of clearing the air of the mines and bettering the lives of the men. William Thomson, an English physician, writing in 1858, insisted that the problem of miners' consumption could not be solved by medical means alone, engineering skill was needed and also correction of the social evils which contributed so much to the sickness of those workers. Britain started her admirable system of vital statistics in 1888 and from then on it was possible to demonstrate what mine work meant in terms of life and death, for the average life span of the miner was only 27.7 years, of the farmer, 42.3 years.

The last fifty years have seen great additions to our knowledge of miners' diseases. We have discovered the mode of action of free silica and we have a fairly accurate idea of how many particles of dust of a certain size constitute the danger limit in the air of a mine. Our diagnostic methods have improved enormously, these advances being due primarily to the work of a brilliant group of British physicians in the mines of the Rand, confirmed by Americans in the zinc-lead mines of the Tri-State region and the copper mines of Montana. This work remains for Dr. Rosen to describe in his second volume, as do also the discovery of asbestosis (English), the discovery of the cancer-producing action of radioactive ores (German), and the still controversial discovery of the inhibiting effect of aluminum dust on the formation of silicosis (Canadian).

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ORGANIC CHEMISTRY

Organic Chemistry. By LOUIS F. FIESER and MARY FIESER. 6 × 9½ in. 1091 pp. Bound in blue cloth. Boston: D. C. Heath and Company. 1944. $8.00. Abridged edition, $6.00.

ORGANIC chemistry is a field of vast extent, whose boundaries have been for decades and are still expanding so rapidly in all directions that each year it becomes increasingly difficult, between the covers of a single volume, to give any adequate survey of this immense territory. In fact, it is no longer a single subject, but has become a group of numerous more or less distinct but chemically related subjects. The author of a one-volume text-book in this important branch of scientific human knowledge, therefore, has presented to him the alternative of restricting either the number