learns it when he attends so-called quiz classes in medicine—he is very likely to lose all of his scientific attitude towards the management of disease. He comes to think of diagnosis as being nothing more than an endeavor to find the text-book name for the disease under which the grouping of symptoms which he elicits happens to fall, and he loses sight of the fact that the symptoms are the outcome of disturbed function or functions, and that they may vary very much indeed in different individuals, according to the degree of physiological disturbance which the lesion creates. He becomes a student of symptoms rather than an investigator of the conditions which are their cause. After all, text-books of medicine are intended only as rough guides for the classification of disease, and it is fatal to efficiency in medical training if this fact is not constantly borne home on the student. He must be taught to study and treat each patient as an individual problem, and just as he has learned in the practical course in physiology that the same experimental condition may lead to different reactions in different animals, so must he expect to find among different patients the same want of uniformity in the symptoms which are produced by the same lesion. The student must be constantly reminded that the practise of medicine is in its merest infancy, and that its growth depends almost entirely on the degree to which it will be possible to apply the accurate methods of physiology and experimental medicine to its investigation. In the past, the development of knowledge of the disease of the circulating system, for example, has depended upon the use of the simple methods of auscultation and percussion; at the present it is bound up with the use of the electrocardiogram, the polysphygmogram and the skiagram, and in the future it will undoubtedly be largely dependent upon methods which will be born and cradled in the physiological laboratories. Every man trained in the right atmosphere becomes a potential contributor to the advancement of clinical knowledge.

In order to carry out these ideals in the teaching of medicine, it is necessary to provide courses such as experimental pharmacology and so-called experimental medicine, in which the more purely physiological experiment is modified so as to show how its results can be used in the investigation of disease. By giving pharmacology in the third year of the medical course, and experimental medicine in the fourth, the difficulty that the student will disregard the scientific aspect of medical practise is much lessened.

In this discussion it should be pointed out that the term physiology is employed in the broad sense under which it was defined at the outset, that is: it includes the physical, the purely biological and the chemical phenomena of life.

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ACCIDENTS IN COAL MINES

THE lack of comparable and accurate statistics of coal-mine accidents in the United States has led the Bureau of Mines to collect such data, and the results of these investigations have been compiled by Mr. F. W. Horton, in Bulletin No. 69, entitled "Coal Mine Accidents in the United States and Foreign Countries," which has just been issued. This report shows that during 1912, 2,360 men were killed in the coal mines in the United States as compared with 2,719 for 1911, and that the fatality rate was lowered from 3.73 in 1911, to 3.15 per 1,000 men employed in 1912. The report contains statistical information concerning the production, the number of men employed and the number of men killed in each state since 1896. From 1896 to 1907 the number of men

killed per 1,000 employed gradually increased with only slight fluctuation; the number killed per 1,000,000 short tons also increased, but the rate fluctuated over a wider range.

During this twelve-year period through 1907, the increase in the death rate was accompanied by an enormous increase in the production of coal. In 1896 the output was 191,986,000 tons, and in 1907 it was 480,363,000 tons, an increase of over 150 per cent. In 1896 each man employed produced 2.64 tons coal per day, whereas in 1907 the daily production of each man was 3.06 tons, an increase of 16 per cent. Since 1907 there has been a marked decrease in the number of fatalities at the coal mines.

This general improvement has been brought about by a combination of causes, the principal one of which has been more efficient and effective mine inspection on the part of the state mining departments and the state mine inspectors throughout the country, supplemented by greater care on the part of both operators and the miners. The investigative and educational work of the Bureau of Mines has kept both the operator and the miner alive to the various dangers connected with coal mining, and has shown what precautions should be taken to avoid these dangers. As a result of these educational features, mining companies are organizing safety committees; providing emergency hospitals, training men in first aid and rescue work, so that in case of a disaster they are equipped to cope with any ordinary accident.

The fatality rates in a number of foreign countries covering a period of ten years, 1901 to 1910 inclusive, are as follows:

Great Britain, 1.36 per 1,000 men employed; Germany, 2.11; France, 1.69; Belgium, 1.02; Japan, 2.92; Austria, 1.04; India, 0.96; New South Wales, 1.74; Nova Scotia, 2.65, while the rate for the United States was 3.74. The low fatality rates in the foreign countries may be accounted for largely by reason of the fact that coal-mine inspection has been in operation much longer than in the United States. In Great Britain the coal mine accident statistics have been collected, published and studied since 1851; France, 1853; Austria, 1875; Germany, 1852; and Belgium, 1831.

A chronological list of the more disastrous coal-mine accidents in the United States shows that 275 accidents have occurred since 1839, in which five or more men were killed at one time, representing a total of 6,777 fatalities. Of these accidents there were 135 that killed from five to nine men each, a total of 859; eighty-two that killed from ten to twenty-four men each, a total of 1,237; twenty-five that killed from twenty-five to forty-nine men each, a total of 870; eighteen that killed from fifty to ninety-nine men each, a total of 1,221; eleven that killed from 100 to 199 men each, a total of 1,534; three that killed from 200 to 299 men each, a total of 695, and one that killed 361 men.

Of these larger disasters gas and coal-dust explosions caused 183 accidents and 5,111 deaths, or over three fourths of the total number of men killed. The next greatest number of deaths were from mine fires, which caused the loss of 1,082 lives, or over fifteen per cent. of the total number killed, by thirty-three separate accidents. It may thus be seen that accidents from gas and coal-dust explosions and mine fires account for more than ninety per cent. of the total number of men killed in these large accidents, although falls of roof, pillars and walls claim nearly fifty per cent. of the total fatalities.

THE RADIUM RESOURCES OF THE UNITED STATES

SECRETARY LANE proposes to withdraw all lands of the public domain suspected of containing radium, that their deposits may be secured for the public good and not become the subject of private speculation. Mr. Lane has outlined his plan in a letter to Chairman Foster of the House Mines Committee, urging immediate passage of a joint congressional resolution to empower President Wilson to make the withdrawals. Investigations of the Geological Survey have located public lands believed to contain the substance now so invaluable in medicine. By the terms of the proposed resolution the Secretary of the In-