SCIENCE.

FRIDAY, JUNE 25, 1886.

COMMENT AND CRITICISM.

NEW HAMPSHIRE is more frequently visited by earthquakes than any other New England state; area for area, it is probably more often shaken than any other part of the United States east of the Rocky Mountains: but we have as yet very little definite information about its shocks. It is probable, from recent studies, that the area affected by a single disturbance is much larger than has been supposed. Systematic collection of records for a number of years is needed; and to this end, members of the Appalachian Mountain club have recently been urged by Mr. W. M. Davis of Cambridge to interest residents in New Hampshire, and elsewhere in New England, to report promptly any earthquake they may feel, noting its date, time (accurately), duration (in seconds), sound, and relative violence (very light, light, moderate, strong, or severe). On the receipt of such report, assistance will be given by the U. S. geological survey to trace the extent of the area affected.

SOME OF THE DIFFICULTIES of forest-culture in the British empire were well brought out at the meeting, May 4, of the select committee of the house of commons, appointed on the motion of Sir John Lubbock to take evidence upon the subject of forestry, with a view to the desirability of establishing a school of forestry. Dr. Sclieh, director-general of Indian forestry administration, in answer to Sir John Lubbock, said that there was a fair field for investing a certain amount of capital in woodland, provided the woods were planted on surplus lands, and not on lands required for agriculture. He did not believe that lands which could be made useful for agriculture would yield the same terms if put in woodland. There was a considerable quantity of waste land in that country which could be set aside for woodland without infringing upon the land required for agriculture. The establishment of a school of forestry would be most valuable, because it would disseminate better views with regard to the management of woods. The Indian government had always been most anxious to help the colonies, and had sent forestry officers to Ceylon, to the Cape, and to Cyprus; but those officers always returned to India because the colonies would not offer them proper terms. The colonies wanted to have men, and to be able to discharge them at their will and pleasure. The Indian government objected to sending away experienced men for the best portion of their working lives, and then to have them return to India in order to be pensioned off. If he were an owner of woods in England under existing conditions, he would probably said his wood bailiff for some time as an apprentic to a shrewd Scotch forester; if there was a school of forestry, he would probably send him to that. A very large quantity of land in Ireland was suitable for woodland; and practically about seven per cent of the land in Scotland was waste land.

THE NEW YORK LEGISLATURE has passed a law for the regulation and control of the practice of veterinary medicine. The law requires the registration of all practitioners, with the evidence of proper qualification afforded by a diploma from some legally incorporated college, or a certificate from an incorporated veterinary society. New York is the first and only state in the union to recognize and protect this profession, as it was the first to establish veterinary schools and to organize a state veterinary society.

IN CONNECTION WITH the article in *Science* of June 18, on a 'Final buffalo-hunt,' it is interesting to note the prospectus of the North-west buffalo-breeding company. This prospectus sets forth that Mr. S. L. Bedson, warden of the Manitoba penitentiary, a few years ago became possessed of a young buffalo-bull and four heifer calves, which have so increased that he now has a herd of eighteen bulls, twenty-five cows, and eighteen calves, all thoroughbred; that, experimenting by crossing with ordinary native cattle, he has found the half-breed possesses largely the characteristics of the thoroughbred, differing only in color, which will make the robe more valuable on account of its novelty; and, further, that, by judiciously crossing the thoroughbred bull with the half-breed cows, he has grown three quarter-

breeds, which closely resemble the buffalo, the head and robes being quite equal, if not superior. Besides the breeding of absolutely thoroughbred buffalo, it is the plan to breed "from selected native or imported Scotch cattle a half-breed that will supply the demand for a perfect buffalo-head; a robe equal in all respects, if not superior, to the best now in the market; and a beef possessing the venison-like taste and nutritious qualities of the pure stock of the plains." The three strong points of the new animal are to be his noble head, his pelt, and his flesh.

AS HAVING A BEARING on the value of the work of the U. S. fish commission, we are glad to give the following figures. The aggregate catch of shad on the Atlantic coast the present year is the largest that has been made since 1872. The Potomac River fisheries show an increase of nearly 100,000 shad over last season. The largest proportion of the catch in the Chesapeake and its tributaries is, however, made by the pound nets in salt or brackish water. The Hudson River was first stocked by the U. S. fish commission with the young of the Atlantic salmon in the spring of 1884. Well-grown sea-run fish weighing from ten to sixteen pounds are being taken at the Troy dam, and there is every reason to expect that the salmon will be permanently established in the Hudson River and its tributaries. The rainbow or California trout which was first introduced on the east coast in 1879, and which has been planted in a number of streams in Pennsylvania, Virginia, Tennessee, Alabama, and North Carolina in the last two or three years, is now being taken by anglers in various localities. Quite a number of specimens have recently been taken in the Holston River in the vicinity of Marion, Va., some of them measuring over eighteen inches in length. This stream was stocked with yearling California trout in the spring of 1884.

PETROLEUM AND NATURAL GAS AS FOUND IN OHIO.

THE introduction of natural gas into Pittsburg and other towns of western Pennsylvania within the last two years, and the marked advantages to manufacturing industries accruing therefrom, have made a great impression on surrounding districts, and especially upon Ohio.

In the last-named state an eager search for the new fuel has been entered upon, and is still going forward at a number of the industrial centres. As a result, many interesting geological facts have been brought to light, some of which have great economic importance. Additions have also been made to our knowledge of petroleum and natural gas. A few of the leading facts that have been established in this connection, and some of the conclusions that seem warranted from them, will be given here.

1. Petroleum and natural gas do not need to be considered apart: they are products of the same strata. Every gas-rock is an oil-rock as well, and all rocks that contain oil contain gas also. These products are often intimately associated in the reservoirs, appearing simultaneously when the rock is pierced by the drill; but in some cases gas only is produced.

When, however, the rock which produces so-called dry gas is followed far enough, it is always found to contain oil as well. Generally the two products are at no great remove from each other. Their separation seems referable to geological structure, as will presently be shown, the gas occupying the higher portions of the common reservoir.

2. The origin of petroleum and gas from organic matter as opposed to the so-called chemical or inorganic theories of their origin, is strongly supported by the facts here furnished. The chemical theories require temperatures high enough to leave ineffaceable marks on the strata from which the petroleum is derived; but no such marks are found in the borings of even the deepest Ohio wells, and some of these wells nearly exhaust the paleozoic scale. There are no igneous intrusions, and no disturbances whatever of the sort that accompany metamorphic action; but from top to bottom the series is normal in all respects, affected only by light dips and low folds.

It is also found that different strata in the same series contain petroleum and gas of different characters: in other words, the character of the product is definitely related to the character of the receptacle and of the strata directly associated therewith.

3. Petroleum exists as such in Ohio rocks. It is actual, and not merely potential. There is no proof that it is now forming. For any thing that appears, the stock contained in the rocks may have been formed contemporaneously with the beds that contain it. There is, it is true, in addition to this petroleum content, a considerable percentage of organic matter in some formations, as in the black shale, which can be converted into gas and oil by destructive distillation, and, so far as we know, by this process alone; but, as shown in the preceding section, there is nothing whatever to lead us to believe that the process of destructive dis-