of the opportunity for judicious exercise the question would be an open one for the physical educator, but we are not speaking of all athletes. Only those who make the teams are subject to the strenuous requirements thereof and they, as a class, need the exercise and stimulus the least. The application of a scholarship rule to keep up the standard of scholarship then seems to us beyond a question desirable. What its effect may be is to be seen in Chart I., where the line of average scholarship in athletics rises about up to, and once above the general college average.

None of these sports, in our opinion, is it wise to abolish: they are too valuable. The responsibility is upon the faculties of our educational institutions to control them.

The number of intercollegiate or interscholastic games may be reduced, the trips cut down, or the varsity season deferred so as to last but a month and promote dissemination of sports, in the way suggested by Mr. Derby in a recent *Outlook*, but the most potent regulation is through scholarship rules.

The raising of these standards is in the hands of the faculty; it does not take great mentality, but plain old-fashioned courage to do this. If each of our colleges and schools would set and maintain such high standards for itself that any league agreements would be well outside them, then the educational ideals would be preserved.

PAUL C. PHILLIPS

THE SO-CALLED VOLCANO IN THE SANTA MONICA MOUNTAINS, NEAR LOS ANGELES, CALIFORNIA

THE California papers have recently contained accounts of a so-called volcano in one of the canyons of the Santa Monica Mountains near Los Angeles. Reports of a similar kind have frequently been made heretofore with reference to points in Santa Barbara County, where fire has started in the petroleum-bearing shale near the surface; and the fire recently observed in the Santa Monica Mountains is due to the same cause. Occurrences of this kind have been described in a recent article in the *Journal of Geology*.[1]

Mr. H. R. Johnson, of the U. S. Geological Survey, now stationed at Los Angeles, visited the locality of the Santa Monica occurrence March 3, and the following notes concerning it were obtained at the time of this examination.

The "volcano" is situated about 200 yards up Pulgas Canyon from the ocean, two and one half miles northwest of Santa Monica, and about fifteen miles west-northwest of Los Angeles. Here a little point of Monterey (middle Miocene) shale jutting into the creek exhibits several small openings, from which very strong sulphurous fumes, light bluish-gray in color, are issuing. At distances of from six inches to a foot or more from the surface in the vicinity of these holes the shale is at a dull cherry-red heat, the temperature being high enough to immediately ignite bits of wood forced into it. The ground, which is here covered by shale fragments and small amounts of humus for a radius of 75 or 100 feet around this group of openings, is uncomfortably hot for the feet and at some places is too hot for even a momentary contact with the hand. At one point an oily condensation, which smelt like hot asphalt, was noted.

The shales show an interesting progressive discoloration which will be described, beginning at the outer edge of the area of alteration. Normally of a dirty yellowish-gray calcareous phase, they are first blackened by the heat, then given that intense peach-blow red which is to be seen in all of those localities in the Santa Maria oil district and elsewhere at which this peculiar type of metamorphism has taken place, while the last stage of oxidation seems to result in a crumbling greenish-gray ashy material. The finding of fragments of scoriaceous shale at the burnt area has recently been reported, but the writer saw none personally. Neither did he see any bursts of flame, which it is said have been seen at the locality, although it is very likely that such might be visible at night.

[1] "Metamorphism by Combustion of the Hydrocarbons in the Oil-bearing Shale of California," by Ralph Arnold and Robert Anderson, *Journal of Geology*, Vol. 15, No. 8, November–December, 1907.

Concerning the geology in the immediate vicinity, the canyon walls, above and below the occurrence, show sharply flexed Monterey (middle Miocene) shales. Just at the fire the structure is synclinal, the axis of the fold trending about parallel with the coast. The canary yellow discoloration of the shale due to sulphur is well developed, and exactly opposite the fire a sulphur spring trickles from the bank. At other points in and near this canyon the shales are impregnated with oil.

There is some doubt as to the origin of the fire. As no brush grows in the vicinity, and no one is living near, the origin can not well be ascribed to ignition from burning refuse on the surface. There has been a thunder storm within the month, before which time people passing up this canyon did not observe anything unusual at this point except a strong odor which was attributed to the sulphur spring. It, therefore, seems likely that the fire was ignited by lightning or else is a case of spontaneous combustion.

This unique variety of metamorphism has been at work locally in many regions of bituminous rocks in California, where a process of combustion of the hydrocarbon contents has altered the naturally white, soft shale to a rock of brilliant rose or brick-red color, and rendered it in cases hard and vesicular like scoriaceous lava. The resemblance of the products to those of volcanoes and the existence of centers like solfataras where the process of burning has been going on during the last half-century, has given rise, as in the present instance, to the statement that there were living volcanic vents in California. Though the combustion is usually local in its effects, the number and wide distribution of the occurrences of burnt shale lend importance to the phenomenon. The presence of burnt shale at depths varying from 90 to 1,040 feet below the surface, as discovered in the drilling of oil wells, proves that the burning has taken place deep down within the oil-bearing formation, as well as at the surface where it has been more commonly found. And, further, the discovery of fragments of it at one place at a depth of at least 10 feet below the surface in bedded deposits of Pleistocene age proves that such action has gone on in ages past.

The Monterey shale, of middle Miocene age, is the principal oil-bearing formation of the state, and the process of burning has had its chief effect upon portions of this formation. It is composed almost exclusively of soft and hard, thin-bedded, siliceous shales, which are largely of diatomaceous origin.

The particular shale area in which the phenomenon described is taking place forms an extensive belt underlying the Los Angeles-Santa Monica plain on the south side of the Santa Monica Mountains. Where exposed this shale is usually petroliferous, and is the source of the petroleum in the wonderfully productive Salt Lake oil field west of Los Angeles. The nearest wells, however, are eight or nine miles distant from the burning area. Although it has been impossible to put out such fires by artificial means in the instances heretofore attempted, such phenomena, as previously stated, have remained more or less restricted. Considering the surroundings and geographic position of the present area the probabilities are against any damage resulting from the burning shale.

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Joint Recommendations of the Physiological and Biochemical Committees on Protein Nomenclature[1]

Since a chemical basis for the nomenclature of the proteins is at present not possible, it seemed important to recommend few changes in the names and definitions of generally accepted groups, even though, in many cases, these are not wholly satisfactory. The recommendations are as follows:

First.—The word *proteid* should be abandoned.

Second.—The word *protein* should designate that group of substances which consists, so

[1] Published by order of the American Physiological and American Biochemical Societies, in joint session at the University of Chicago, on Tuesday, December 31, 1907.