munications which originate with the employees of the great business activities of the country. These papers are by no means wholly of an applied or utilitarian character. There is an abundance of pure science, of abstract discussion, obviously encouraged by the business administrations in question. In other words, the promotion of pure science has been acknowledged as exceedingly good business. The American business man has been quick to appreciate the value of research, once its meaning was brought home to him, and he is now enthusiastic in opening new paths to hiding-places of nature. That such paths are apt to lead undeviatingly from his own private domain is here of secondary importance.

The reaction of all this on the professor may well be looked at with misgiving. The college in the future, as heretofore, will necessarily insist on the primary importance of teaching. Instructors come to us with functionally well-equipped brains, aglow with the brightness of a young man's ardor, strong in the beautiful hope of achievement and with youth's illusions all undimmed—only to be forever confronted by the elusive response of the average student. Nothing is so deadening as the prolonged contact with the uninformed, the indifferent; for it keeps a low standard of comparison always in view. Eventually a man will measure his own mental stature by its elevation above that humble level. If the incentives to a stimulating competition, to an emulation among professional compeers, are also lacking, the distortion of intellectual values may be complete. A persistent urge, like a physical field of force, however weak, is a very dangerous agency. Watching sleeplessly, like Satan, over the course of things, it may even convert a faculty of high aims and specifically equipped scholarship into a body of schoolmasters. The exalted obligation incident to exceptional training is creative, an enlargement of the boundaries of knowledge, a new voice in art; but its fruition may degenerate into some academically dignified clerkship. A mute inglorious Darwin may be detecting new group affinities among old courses, or piecing together the parts of some academic picture puzzle. It is not the strong bias, but the monotonous continuity of petty bias that quenches. At some instant of flickering the sacred flame is blown out.

In the end, I fear, the trusts, as we fondly call them, will have absorbed and assimilated *l'élan vital,* the soul of the university. It is they who will point out to our bewildered gaze the sweep of new horizons and the flotsam from undiscovered shores. Our faculties will have to teach what they have been taught by the great business corporations. These will hereafter break new pathways into the unknown, and it will be for us to tell the uninformed the Ultima Thule of their progress. The university will be the humble expository mechanism of the intellectual accomplishments of commercial enterprise. In brief, there will be a complete inversion of the method by which the world's knowledge has deepened in the past.

If one looks, for instance, at the highly ingenious contrivances by which the marvels of the Hertzian wave have recently been brought to the appreciation of the people, one is struck by the appearance on every clamp, every ferrule, every coil, every tube, almost on every plate and screw of the mysterious symbol, PAT. This PAT. is a cipher more potent than any formula of Cagliostro. It is behind an array of PAT. that the wisdom of the future will be entrenched, and above which so much of it as may be vouchsafed us will be broadcast. Our function will resemble the town crier's, to herald the information somebody else has wrested from the infinite. We shall still be interested and keenly watchful, no doubt, like the little cherubs with wrapt gaze at the feet of the Sistine Madonna; but the great inspiration will float majestically above us.—*Dean Barus in the annual report of the president of Brown University.*

## THE TECHNICAL PAPERS OF THE NATIONAL GEOGRAPHIC SOCIETY

THE National Geographic Society announces a series of technical papers embodying the scientific results of its Katmai, Alaska, expeditions. The first number entitled "The origin and mode of emplacement of the great tuff deposit of the valley of ten thousand smokes," by C. N. Fenner, is now ready.

Dr. Fenner's paper gives details of the hot sandflow not included in the nontechnical volume, "The valley of ten thousand smokes,"

by the writer, recently published by the National Geographic Society.

This series of papers from time to time will embody researches in diverse fields of science resulting from National Geographic Society expeditions. Notices of their appearance will be sent to all who desire such notification. The papers themselves will be distributed only to those who specifically request them.

An abstract of Dr. Fenner's paper follows:

The valley of ten thousand smokes is filled with a thick deposit of fragmental material, which was extruded during the great eruption of 1912. Although similar in composition to the ashfall from Katmai, this material evidently flowed down the valley under gravity like a liquid. At the time of its extrusion it was highly heated, for all vegetable matter which it touched was completely reduced to charcoal.

Several lines of evidence indicate that this tuff could not have come from the crater of Katmai: (1) The slopes down which it would have flowed are covered with a large glacier whose surface bears no indication that an avalanche of hot material passed over it. (2) The topographic relations of the several parts of the deposit make it practically impossible that Katmai crater or any other single source (either outside the valley or within its borders) could have supplied the material to all areas that it covers.

It is concluded, therefore, that the tuff must have come from a number of vents, and further inquiry reveals no other probable source than the fissures that have disrupted the valley floor (and to a less degree, the floor of Katmai Pass and the lower slopes of Trident) and are now marked by lines of fumaroles.

At the time of its extrusion the temperature of the material was sufficiently high not only to carbonize tree trunks but probably to produce secondary explosions where it came into contact with streams of water.

The extrusion of this material preceded the explosion of Katmai, as its surface is, in general, covered by the ashfall.

Most of the material is a highly silicious glass, inflated into pumice or shattered to fine dust, but mingled with this is a considerable amount of basic pumice and scoria, together with fragments of old andesites, sandstone and shale. The old basic rocks have been much digested by the new magma, producing great quantities of banded pumice in which both old and new components are easily distinguishable. The sediments are attributable to the Jurassic strata that underlie the valley everywhere, but the source of the old volcanics is more of a problem.

Something of the conditions of digestion of the old lavas can be learned from a study of Novarupta volcano, the largest vent in the valley, which is now plugged by a "dome" of highly viscous lava. A large amount of old basic lava evidently became involved in the newly rising silicious magna and was melted down by it. The author believes that the source of this old basic material was derived from the morainal deposits rather than from bed rock below the vent.

It is thought that the best explanation of the practical restriction of fissures to the valley floor is that a sill-like wedge of magma was intruded between the horizontal strata underlying the valley and produced by its upheaving action a block-like fragmentation of the roof where thinnest. The fractures then served as orifices of extrusion for portions of the magma.

The surface outburst seems to have behaved very much like the *nuées ardentes* of Pelée and La Soufrière and to have spread as a hot sandflow through the valley. A surprising feature is the extremely low angle of repose (little more than 1 degree) finally assumed. This and other features seem best explained by supposing that evolution of gas from the magma continued during the movement of the sandflow and was the central feature of it. The characteristics of this form of eruption and the factors to which they are due are discussed in some detail.

## SPECIAL ARTICLES

### THE PRECIPITATION OF METALS BY HYDROGEN SULFIDE

IN connection with Professor Neuhausen's[1] appreciative discussion of a note of mine[2] on the precipitation of metals by hydrogen sulfide, I desire at this time to call attention to a newly

[1] SCIENCE, Vol. LVII, No. 1462, p. 26, (1923).
[2] *J. Am. Chemical Soc.*, 44, 1500 (1922).