Thirty Years of Geology

H. E. BROWN, Oklahoma City

Nothing diffuses more slowly than an idea. This seems to be true, at least, of mental gleams which are born in the murky atmosphere which surrounds educational thought and practice. Let an individual or a school system recognize an important educational need: fifty years may well go by before anyone does anything practical about it. Fifteen years later, the new technique or practice, assuming it is actually a valuable one, will have found its way into some 3 per cent of the school systems of the country. At this point, the tempo of diffusion increases markedly, continuing at a high rate for the following 20 years. At this point a falling off of the rate of spread is to be noted, since most of the receptive schools have been reached, leaving only the "Good-enough-for-grandpa" types, which are sterile ground for any kind of educational experimentation.

It is interesting to project the development of geology as a high school subject of study against this none-too-encouraging schedule. Geology, as we know it today, is a very young science; even its name was coined as recently as 1778. It was introduced into Yale College in the early part of the nineteenth century by Benjamin Silliman, whose complaint that the college laboratories lacked acid with which to test carbonates is an eloquent reflection of the state of the science at that time, even in the leading institutions. The traditional high school sciences were introduced into the secondary curriculum during the seventies and eighties. The starting point of earth science at this level is vague, but it may be said to have followed the other sciences by a decade or so.

The teaching of geology was begun in Oklahoma City high schools just thirty years ago. Pioneering in this field was a rugged and frustrating experience. No guides, no precedents, no textbooks (other than physical geographies or college texts); no one who had ever so much as dreamed of preparing himself to teach the subject in high school. The State University, at least its Committee on Entrance Requirements, was definitely hostile to the ragged and ill-nourished addition to the curricular family. Thus it was, doubtless, with other schools, if any there were, which ventured into the geological field during this period of incubation.

By the 1930's, things began to improve. A teacher or two was added. Other high schools in the system began experimenting with geology. Toward the end of that decade enrollment in the subject ran above 700 in Oklahoma City, and word came from schools in other parts of the country which were introducing it.

This point, I should say, marked the beginning of the second stage of growth of geology in secondary schools, the period of slow but steady increase and of internal consolidation. The fifteen years which have elapsed between that time and the present have seen the spread of this subject into all parts of the country except the South. We find it taught in Texas, New Mexico, California, Colorado, at many points in the Northwest. We find classes in it in Illinois, Minnesota, Ohio, Connecticut, New York, and elsewhere. In no state is its concentration great, but everywhere it seems to be growing.

The spread of geology into the country's high schools has been accompanied by a significant inner growth. Earth science, as first presented, consisted almost entirely of physiography; concern was with the form of the earth's surface features. Little that would now be called laboratory work was included. More recently a dynamic approach has been taken, in-

terest centering on the origins and metamorphoses of the earth forms. Now another shift in point of view seems to be taking place. Historical geology has appeared upon the scene in many places, and bids fair to prove a most popular phase of the subject. Laboratory work has also assumed a scientific character.

Through the years, geology has been pushed steadily downward from above, so far as grade level is concerned. When it finally reached the high school, it was at first confined to the upper grades, on the theory that it draws so heavily upon the sciences of physics, chemistry, and biology that they should be studied before geology was to be undertaken. From science to phenomena; today, of course, we take the more inductive approach, proceeding in theory at least, from phenomena to science, and ultimately back again. Geology, therefore, has generally gravitated toward the ninth and tenth grades. Psychologically, this placement is supported by the researches of Hanor Webb and other investigators in this field.

There are many reasons for the inclusion of geology in the modern high school curriculum. It easily captivates the interest of the student because of its ready applicability to his everyday surroundings, establishing, from his very first lesson, liaison between the textbook and his own back yard. Interest is vastly enhanced by field trips, in which respect geology is a science par excellence. Oklahoma, with its four mountain systems, its redbeds, its oil and gas and zinc and glass sand, its fossils, and its superb exposures of Paleozoic strata in the Arbuckle section, is indeed a geologist's paradise. Geology is also by far the most economical science to administer; first rate laboratory work can be conducted for about one-fourth the cost per pupil of any other of the usual sciences. The correlation of geology with the economic life of the state and the nation is self-evident.

Greatest of all is geology's esthetic value. It puts the student on familiar terms with river and mountain, glacier and volcano. And just as astronomy takes him out unthinkable distances into space, so geology takes him back into unfathomed eons of time, helping him, perhaps, to put into somewhat better perspective the uncompromising, and sometimes unlovely, realities of the present.

We are, very possibly, at the threshold of the prosperous twenty-year period of development for the subject of high school geology. We see indications of this not only in the introduction of the subject into many school systems, but in the almost phenomenal interest which has sprung up in the subject among the public. Within the past ten years hundreds of amateur mineralogical societies have sprung up, having tens of thousands of members. The collecting and polishing of semi-precious stones has become a widespread hobby. Speleological clubs have been formed among cavern enthusiasts. Dozens of articles on these and other geological subjects have appeared in some of the leading popular magazines. Several periodicals devoted entirely to geological material have appeared on the market. This sudden wave of interest in the earth and its mineral products can hardly fail to be reflected in the high school curriculum of the near future. The pioneer geological trail was a rough one, but it gives promise of opening out, within the next few years, into a very decent highway.