Bizzozero attributes the origin of thrombi in blood-vessels to the destruction of these corpuscles. He has been able to watch the process of formation in the mesenteric vessels of living animals when a lesion of the walls of the vessels was produced in any way.

In the blood of animals with nucleated red corpuscles, Hayem has described a form of corpuscle which has properties analogous to those possessed by the blood-plates of mammals. These corpuscles may be preserved for study by the use of the liquids mentioned above. They are colorless, nucleated, slightly flattened bodies, bearing a general resemblance in shape to the red corpuscles, though usually more elongated at one or both of the poles. They vary greatly in size, but as a rule are somewhat larger than the white corpuscles. They are distinguished from the white corpuscles mainly by a difference in form and by the changes which they undergo after the blood has been shed. The white corpuscles are always more or less spherical, while the plates are flattened disks. After the blood has been shed, they become exceedingly viscous, and form granular masses from which fibrous processes radiate. Their functional value in coagulation appears to be the same as that of the blood-plates in mammals with non-nucleated red corpuscles.

William H. Howell.

THE COMSTOCK LODE.

Geology of the Comstock lode and the Washoe district. By George F. Becker. (Monographs U.S. geol. surv., iii., with an atlas.) Washington, 1882. 422 p. 4°.

The appearance of the second of the new series of monographs published by the U. S. geological survey will be greeted with pleasure by the scientific world, not only on account of the amount of new information it contains regarding the geological and physical character of one of the most important ore-deposits on the globe, but also as an index of the increasing interest which is being taken in this country in a very important but comparatively new branch of geological research. Becker's report contains, with perhaps one exception, the most considerable contribution yet made by an American to microscopical petrography, and deserves for this reason, aside from its other merits, high commendation.

Referring, for a historical, economic, and technical treatment of the Comstock lode, to the works now in preparation by Messrs. Lord and Eckart, the author devotes himself to a purely scientific investigation of this interesting region. A *résumé* of the results reached by von Richthofen, Zirkel, King, and Church, is given, which is followed by a detailed description of the rocks in connection with which the ore-deposits occur. This work is carefully done, and, notwithstanding a very apparent lack of acquaintance with the literature and many important methods of modern petrography, is a valuable contribution to the subject. For instance: the actual presence of the suspected sodalite in the granite might easily have been placed beyond a doubt by a simple microchemical test. Again: the measurement of extinction-angles would have been much more satisfactory had they been made on cleavage pieces from their isolated powder instead of in the sections; while Boricky's test would certainly have yielded as good results as Szabo's.

The variety of rocks in the area studied is very great, comprising, in order of their ages, granite, metamorphics, granular diorite, porphyritic diorite, metamorphic diorite, quartz-porphyry, earlier diabase, later diabase, earlier hornblende andesite, augite andesite, later hornblende andesite, and basalt. None of these exhibit in their occurrence or structure any thing very striking or abnormal, if we except the sodalite in the granite, whose presence is, however, left very doubtful. Of especial interest are the decomposition processes, which have altered the rocks in the area between the Comstock and Occidental lodes almost past recognition. These are thought to be due to solfataric action, which was not earlier than the eruption of the later hornblende andesite; and they have received a good share of the author's attention. All the rocks of this area are equally decomposed; and, in the case of all, the same minerals have undergone the same alteration. Hornblende, augite, and mica change into chlorite, and this in turn generally to epidote, though sometimes to a mixture of quartz, calcite, and limonite. The felspar becomes filled with secondary fluid inclusions, and finally forms a mass of calcite, quartz, and a substance of unknown character, which, according to the author, is certainly not kaoline.

By far the most interesting results of the author's studies, from a petrographical standpoint, are those arrived at in reference to the origin and nature of that much-discussed rock-type, propylite. As is well known, this name was given by von Richthofen to certain early tertiary, andesitic rocks of Hungary, possessing a fibrous green hornblendic constituent and a granitic habit. Both von Richthofen and Zirkel regarded the Washoe district as a locality where this type was especially well developed; and the present author entered upon his work fully convinced of the correctness of their views. All the more interesting, then, is the fact that a careful and elaborate study of these

very rocks forced him to the opinion that propylite has no right whatever to be regarded as an independent rock-type, but is always an alteration product of diabase, diorite, or andesite, by the change of the bisilicates to uralite or chlorite.

In chapter iv. the author discusses theoretically the structural results of faulting. He regards the schistose structure, so often observed in the andesite, as the result of faulting under intense lateral pressure, and shows that such sheets would naturally tend to arrange themselves in a logarithmic curve, as seems to be the case at the Comstock.

The chapter on chemistry is not very satisfactory. But few new rock analyses are offered, and none are ably discussed in connection with the microscopic diagnosis. The finding of very small quantities of ore in the accompanying rocks, especially the diabase, would seem to suggest just the reverse course of reasoning from that adopted; and certainly none of the facts presented appear to warrant the supplanting of von Richthofen's theory, that the ores came from great depths, by one ascribing their deposit to segregation produced by ordinary solvents (hydrogen sulphide and carbon dioxide) from the rocks at the side of the lode.

The discussion of the heat-phenomena of the lode receives especial attention in chapter vii. The rapid increase of temperature is well known to be one of the great hinderances in working the mines, being nearly double the average observed elsewhere. This has been accounted for by some by chemical action: as, for instance, the oxidation of pyrite, or the kaolinization of felspar. The author concludes, however, in light of the careful experiments conducted by Dr. Barus in reference to the latter theory, that such an explanation is untenable; and that the source of the heat must be sought in former, and not entirely extinct, volcanic activity.

The observations of Dr. Barus, bearing on the electrical activity of ore-bodies, are recorded in chapter x. They relate as well to the deposits at Eureka as to those in the Comstock, and, while not directly productive of results of practical importance to the prospector or miner, possess a very considerable scientific interest.

The execution of the plates and maps is up to the usual high standard of the survey publications. The chromolithographic representations of rock-sections in polarized light are particularly successful, and, as far as my experience reaches, are the best of the kind yet produced anywhere.

MARTIN'S ELEMENTARY PHYSIOLOGY.

The human body: an elementary text-book of anatomy, physiology, and hygiene. By H. NEWELL MARTIN. New York, *Holt*, 1883. 11+355 p., 4 pl., illustr. 16°.

THIS volume forms the second volume in the 'American scientific series, Briefer course,' published by the Messrs. Holt. It is an abridgment of a larger work by the same author, and is intended for use in schools and academies. The demand for such a book, and the difficulty of preparing one, are well known to any one who has sought in vain, among the numerous text-books now in the market, for one really scientific, and suited to the age and needs of his pupils. It is a book of about three hundred and fifty pages, but how it could well have been made smaller we do not see. The language is simple, the style clear, and the book, at the same time, easily comprehensible and thoroughly scientific. It is elementary without being superficial. The essential facts are pointed out to the pupil without taxing his memory with a mass of unimportant details, or vexing him with conflicting theories on unsettled questions. At the end of each chapter these are condensed, and their connection shown in a brief summary, which aids the memory, and excites the interest of the pupil. From the physiological facts are deduced the most important laws of hygiene, while the student gains glimpses of wider fields of anatomy and zoölogy in the footnotes.

A new and most important characteristic of the work is the series of directions to teachers for demonstrating on frogs and rats the main outlines of anatomy, and for physiological experiments accompanying each chapter. These are all clearly explained, and easy, yet it is to be feared that they will be neglected by three-fourths of the teachers using the book. Their importance might well and justly have been far more strongly urged in the preface. We hear every year less of the objections to such dissections. The great difficulty is, that most of the teachers in our schools and academies have been taught physiology in the old way; and many of them have never even seen the inside of a frog. They greatly over-estimate the difficulties of such dissections and experiments, and do not appreciate that the sight of the real organ or process is worth more to the pupil than an hour's study of text-books or charts. If the teacher will once try fairly the experiment of following these directions, he will be surprised at the small amount of extra work caused, and at the enthusiasm